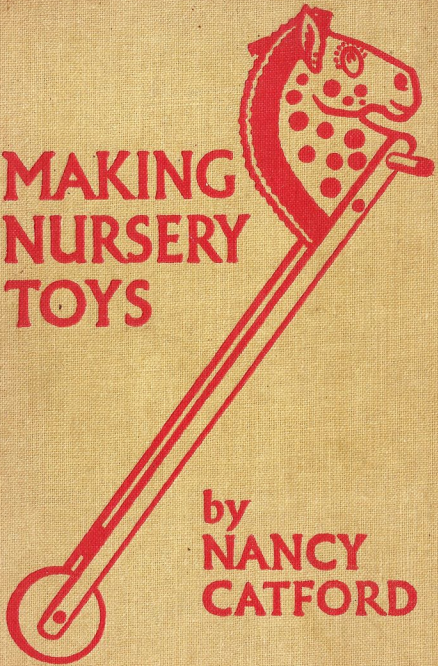
Frederick Muller • MAKING NURSERY TOYS • CATFORD

MAKING NURSERY TOYS



by NANCY CATFORD

MAKING NURSERY TOYS

WRITTEN AND ILLUSTRATED
BY
NANCY CATFORD
ORGANISER NURSERY EQUIPMENT WORKSHOP
FOR THE NURSERY SCHOOL ASSOCIATION OF
GREAT BRITAIN

LONDON
FREDERICK MULLER LTD
29 GREAT JAMES STREET, W.C.1

FIRST PUBLISHED BY FREDERICK MULLER, LTD.
IN MARCH, 1944
PRINTED IN GREAT BRITAIN BY WYMAN & SONS LTD.,
LONDON, READING AND FAKENHAM

Sixth Impression, 1950

DEDICATED TO
TOYMAKERS EVERYWHERE

MORE VIGOUR TO YOUR SAWS
MORE COLOUR TO YOUR BRUSHES

CONTENTS

INTRODUCTION

THE enormous increase, since 1939, of war nurseries and nursery classes has led many novices to try their hands at toy-making in order to help equip these nurseries. Much time and energy and precious materials have gone into making toys not always suitable for the daily use of twenty to fifty children. This book offers suggestions of toys of tried strength and educational value. All the samples shown have been made at the workshop of the Nursery School Association and the Friends Relief Service, which was started in 1942 in order to try and help the many nursery toymakers. It is with some reluctance that such full details have been shown in this book, as people should, of course, design their own toys; but experience at the workshop showed that busy folk were glad of careful measurements to adjust to their own ideas.

The strongest and simplest, though not necessarily the only methods are shown, and the three aims of good nursery equipment—STRENGTH, GOOD DESIGN and PRACTICAL USE—borne always in mind.

STRENGTH

Toys must be really strong and soundly constructed. It is a waste of labour and materials to give the Christmas-tree type of toy for the daily use of 20 to 50 small children. Test your toys in every way you can think of and if breakages occur when a toy is dropped or thrown across the room, your technique and construction are not sound enough for nursery use. It is the uncontrolled strength of little children, combined with their very proper passion for experimenting, that puts such a strain on their toys.

GOOD DESIGN

In the home and the nursery the foundations of good or bad taste will be laid and early impressions are of vital importance. If only well-designed toys are used, they are bound to have effect on the future good taste of the youngsters.

Good design includes good finish. The feel of a toy or a piece of furniture is as important as its shape or colour. Have no sharp corners or edges that prick the hand and are a source of splinters or dangerous if a child should fall on the toy.

PRACTICAL USE

Toys are not the frivolous time-passers that many grown-ups imagine; they are the equivalent of books and apparatus of older children. Through them are learnt shape, size, colour, balance, judgment, and manipulative skill; they also give scope for creative and imaginative play. All nursery toys should have an educational purpose, to be used at the child's own time. You should be able to DO something with a toy—not just look at it.

The toys shown are by no means exhaustive, but the main types of small toy needed in nurseries are dealt with fairly fully and suggestions given for a few of the larger types of toy.

* * * * *

This book has been written with the help and collective experience of all members of the workshop of the Nursery School Association and Friends War Relief Service. Together we worked out the best and simplest methods of construction, always with a view to the toys being copied by possibly inexperienced people. To all the workshop members my very best thanks for their collaboration, and particularly to Eric Parkin and John Doble who have designed many of the toys; to Winifred Wallace who has been the workshop's soft toy adviser and who has suggested much of the improvised apparatus; and finally to Lady Allen of Hurtwood, without whose vision and energy the experimental workshop would never have been started or this book have been made possible.

NANCY CATFORD.

March, 1944.

TOOLS AND METHODS

THE expert carpenter with a complete kit of tools will not need these notes; they are written as a guide to the many folk with little experience and few tools, in the hope that it will help them overcome what they may have hitherto considered to be insurmountable difficulties.

A few of the toys can be made using only a penknife, and the whole of them can be made using the following tools:

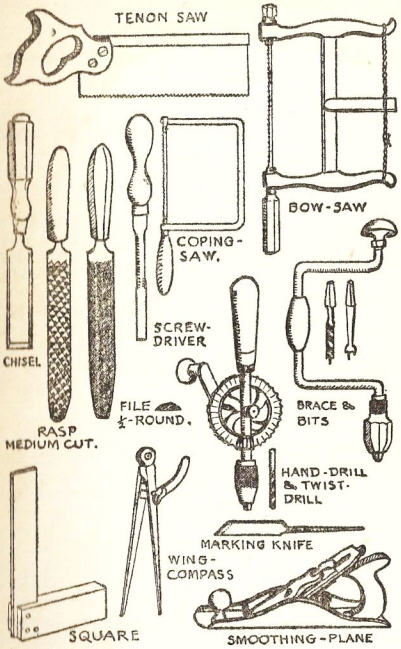
ESSENTIAL.	ALSO DESIRABLE.
TENON SAW, about 10".	**CROSSCUT SAW (10pt.—22").**
BOW SAW or COPING SAW.	**CHISELS, ¼" and ½".**
CHISEL, ½".	**RASP, medium and fine.**
SCREWDRIVER, 5".	**FILE, small, triangle.**
HAMMER, medium size.	**FILE, small, rat-tail.**
9" METAL SMOOTHING PLANE.	**FRETSAW.**
FILE, 8" (half round, bastard cut).	**HAND-DRILL and 6 or 7 twist drills.**
STEEL SQUARE, 10".	**CALLIPERS.**
BRACE and 4 or 5 bits.	**MARKING GAUGE.**
PAIR WING COMPASSES.	**4" MALLET.**
RULE, 2-foot.	**VICE or CRAMP.**
MARKING KNIFE (penknife can serve).	**BRADAWL.**
	PLIERS.
BENCH HOOK (can be home-made, see page 13).	**SMALL HACKSAW.**

OIL-STONE FOR SHARPENING (India Combination-stone, i.e. fine and coarse is best if obtainable).

Even the plane is not absolutely essential, although I would advise you to make every effort to obtain one and learn its uses, and especially how to sharpen it and the chisels. **YOU CAN NOT DO GOOD WORK WITH BLUNT TOOLS.** It is, however, possible to do many of the plane's normal jobs, rather laboriously, with a chisel and file.

WOOD

Hard woods stand up to the rough usage of a nursery, better than soft. Mark your work out, taking care that the grain of the wood runs along not across narrow



pieces, as wood splits in the direction of the grain. Never hit wood with a metal hammer; if you have no mallet, knock your joints in place with a piece of waste wood between the hammer and the work.

If in your district you find it quite impossible to obtain a bow-saw, coping saw or fretsaw, you still need not be deterred from making wooden figures.

The majority of the designs shown can be adapted so that they can be cut with a tenon-saw and any curved parts finished with a half-round cabinet-maker's file, or with a chisel and rasp or file. This naturally takes longer than cutting with a bow-saw, but can have equally good results.

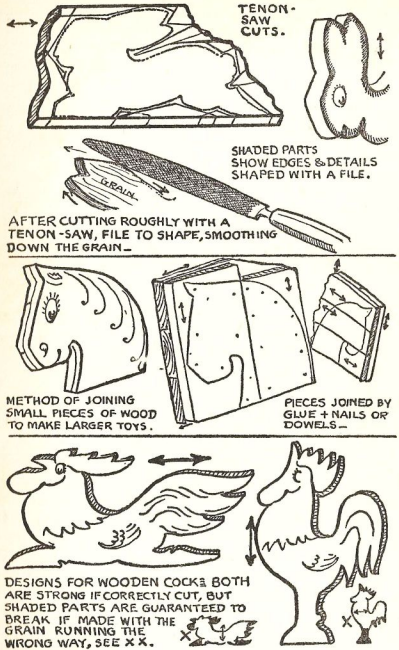
The diagrams show how to design birds and beasts in wood with the maximum strength possible. **THE ARROWS THROUGHOUT THE BOOK SHOW THE DIRECTION OF THE GRAIN OF THE WOOD.** This is most important.

If you have not wood of the appropriate size for some of the larger toys, you can build up as shown. Glue and nail the pieces together and put under pressure overnight; they must of course be carefully planed up so that the joints do not show.

MARKING OUT

It is an amateur fault to imagine that a pencil line is easy to follow. It is much easier to work to a line made with a guage or with a marking knife which grooves the wood as it is drawn along a steel rule or square; the saw or chisel used for cutting the wood will go much more easily into the groove than elsewhere. To make the line more visible run your pencil down the line, but pencil alone is insufficient. Mark circles with wing compasses or dividers. Test your work constantly with your steel square to be sure your right angles are true.

Grasp your tool firmly as though you really meant it, especially when using a saw, plane or chisel. Take off only a little wood at a time when planing or chiselling.



HOLES

Hold your Brace or Drill either absolutely vertically or horizontally. It is essential with apparatus which necessitates the fitting of several loose parts, that the holes and pegs be perpendicular. Wheels will not run true if the holes for their axles are not correct. If a hole is to be made to fit a certain sized dowel-rod, don't conclude that a $\frac{1}{4}$" drill fits a $\frac{1}{4}$" dowel; test them first on a piece of waste wood. Even stock sizes vary slightly.

PEGS AND DOWELLING

Dowel-rods are becoming increasingly difficult to obtain, and it is not generally known that it is possible to make your own. This can be done by using a Dowel Plate which is a thick piece of metal in which are bored suitable sized holes. The wood is shaped roughly to the correct size and then knocked through the dowel plate with a mallet. Another, more laborious, method is to plane your wood approximately and finish it with a coarse file, then finer file and glasspaper, testing constantly with the callipers. This needs practise but it is surprising how accurate results can be.

BOW SAW AND COPING SAW

These will cut up to 3" wood. They are like glorified fretsaws but stand up to rougher usage as they have blades $\frac{1}{2}$" wide. A fretsaw is, however, essential for making jig-saw puzzles.

GLASSPAPERING

A good woodworker rarely uses glasspaper, getting his perfect finish with sharp tools. In toy making, however, glasspaper is an essential. The pieces of apparatus must feel satin smooth to the touch. Most amateur work suffers severely from lack of sufficient care with glasspapering. A small piece of fine No. 2 paper wrapped round the first two fingers is an effective and controllable way of using glasspaper for very small parts. Another good method is a quarter sheet of the paper

held on a scrap of wood or cork block and used like a polishing brush, rubbing in the direction of the grain towards the outer edge of the wood. Sharp corners or splintery and rough bits should definitely NOT be left on any nursery toys. It is the most tedious part of a toy-maker's work but one of the most vital. DON'T SCAMP IT!

PLANING

For serious carpentry a Smoothing Plane is essential for smoothing the wood, but if it is quite impossible to obtain one you can get a reasonably accurate finish by first chiselling or rasping the wood and finishing with a bastard-cut file. If this is worked diagonally across the wood it leaves a smooth surface.

GLUING

Don't think a glue-pot is tedious to use. A tin of a good make of glue, heated in a saucepan of water, is useful, but the glue-pot and good Scotch glue is better and much cheaper. Break into small pieces and soak the glue for half a day before heating for the first time.

"Lepage" glue is a good make which does not require heating. Warm faces of wood to be glued, especially in cold weather.

Put a very thin coat of glue on BOTH faces to be stuck together; it is a mistake to put a lot of glue on a joint—it is both wasteful and messy to clean up. Where possible rub the glued faces together well before setting into place under pressure; this is to exclude air from the glued joint. If you wipe off with a damp cloth all surplus glue while it is still warm, you will save yourself a lot of trouble in chipping it off when once it has set hard. If the wood is to be stained you must be extra careful to remove the slightest trace of glue, as the stain will not take on top of it. Leave glued work under pressure for at least 12 hours before working on it.

SCREWS

Screws are often put in wrongly, either too tightly so that they will not screw home without splitting the

wood or having their own heads screwed off, or so loosely that they come easily unscrewed. The diagram shows the general procedure for fixing; the relative sizes of drill used are important. A screw for fixing any wheel should go at least $1\frac{1}{2}$" or 2" into the base of the toy.

Always mark the position for your screws with a nail or a Centre Punch which dents the wood, ensuring accuracy when drilling the hole, in the same way as the groove made with a marking knife guides your saw-cuts.

NAILS

Nails should not be bashed straight into the wood. First make a hole with a Bradawl or Gimlet, particularly for the larger round nails. Oval brads or panel pins are best for small, and panel pins for very small work. Several small nails are stronger than a couple of large ones; always punch nails well in for extra strength.

Nails driven in askew alternate ways are stronger than a row of nails all knocked in dead straight.

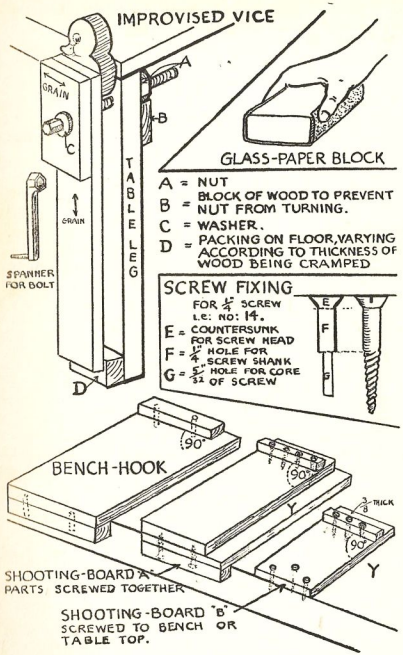
JOINTS

Good joints for nursery toys are shown on page 39, Hammerpegs (jointed, glued and nailed or dowelled) on page 83, Truck (glued and nailed from two angles) on page 57, Bed (jointed, glued, nailed or dowelled and further strengthened by a side piece).

Remember that super-human strength of the uncontrolled movements of a five-year-old. YOU CANNOT MAKE YOUR TOYS TOO STRONG!

HOLDING YOUR WOOD

If at all possible, procure a woodworker's metal Vice to grip your work, or a metal vice with wooden faces over the angles of the jaws. Its help will greatly speed your work, but don't be deterred from making things through lack of a vice. Your Bench-hook will help you enormously, or you can cramp your wood to a table or bench, being careful to place a piece of wood with well-rounded edges between the cramp and your work, so that the latter shall not get bruised.



You can improvise a vice with one of the long bolts from an old wooden framed mattress. The box handle can be used to open or close the vice. A 9″ or 10″ carriage bolt with a spanner as handle can be used in the same way. (See previous page.)

BENCH-HOOK

This can be made at home and is extremely useful for all sorts of toy-making jobs. It is possible to work on any strong firm table by doing your sawing, chiselling, etc., on the Bench-hook, thereby saving your table or bench much unnecessary wear. Use dowels for joining your bench-hook parts or counter-sunk screws. 11″ × 8″ is a good size to make. (See page 13).

SHOOTING-BOARD

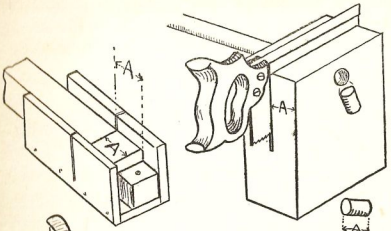
This is also a very useful though not an absolutely essential piece of equipment. It is used when squaring up the ends of timber. The plane runs on its side at "Y" and is carefully set so that it cuts only above the level of the face of the shooting-board. Two types of board are shown, either of which can be home-made. Size about 16″ × 9″ is usual. (See page 13).

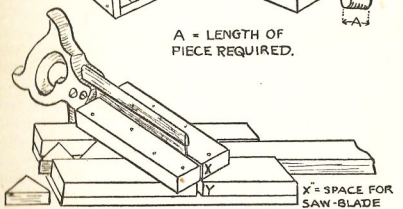
MITRE-BOX

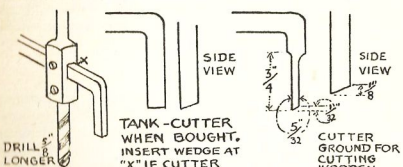
The normal use of a Mitre-box as an aid to the accurate cutting of 90° and 45° is well known. Many variations of the box can be made to speed up the making of such toys as mosaics or sets of bricks. If many similar pieces are to be cut, it is worth while to fix a stop, against which the wood can be firmly pressed while it is cut to the exact length required.

Dowels may be cut in a block through which a hole $\frac{1}{16}$″ larger than the dowel, has been bored. The dowel is pushed through the hole, its end flush with the face of the wood block, sawn off and pushed through as many times as needed.

For very accurate work such as triangle mosaics or bricks, the tenon saw can be held very firmly by two pieces of wood screwed on to the top of the mitre-box on







SEE PAGE 19

each side of the blade, so that the saw can slide but has no play. The saw is pushed in from the end, as the set of the teeth prevents them from passing between the two pieces of wood.

REPAIRS AND IMPROVISATION

A few general hints on repairs may be useful.

Whenever possible, where wood has split, rip off the broken part and put on a new piece. Weak joints or splits may be made quite firm or even new joints made, by nailing and gluing a triangular piece of three-ply on the join.

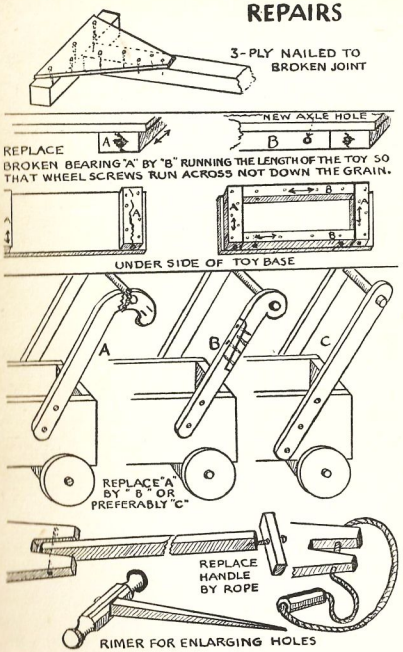
Where wheels keep coming unscrewed, it is often because the bearings are made of soft wood, the screw being driven into the end grain. Either use a larger, longer screw or fix new bearings lengthways along the toy base. The wheel-screws will be driven into this across, not down the grain.

Alternatively, fix dowel axles ($\frac{1}{2}$" or larger) with the aid of gas-pipe clips screwed underneath the bearings. These are easily obtainable and are cheap. A $\frac{3}{8}$" clip allows a $\frac{3}{8}$" dowel to revolve in it and fits tightly on to a $\frac{3}{4}$" dowel; a $\frac{1}{4}$" clip allows a $\frac{1}{2}$" dowel to revolve and clamps a $\frac{3}{8}$" dowel tightly. (See barrow wheel, page 23).

On new toys remove wheels which have no washers, as screw or nail heads wear holes very quickly in wooden wheels unless protected by washers on either side of the wheel. Replace with a slightly longer screw than the one which previously fixed the wheel.

BROKEN HANDLES

Wooden pulling handles are best replaced by rope. Pushing handles often break because they try to imitate metal and bend elegantly, which means that vital parts are short-grained and snap. Replace by straight handles or ones with less refined curves; screw these firmly on. If the handle is broken at the end only, it may be possible to mend it by splicing on a new piece. Make this long



enough to get three or four screws to hold the parts together and glue as well. Countersink the screw-heads.

IMPROVISING TIPS

If you have no compasses, draw round a halfpenny, penny, cup, saucer or plate, according to the size of circle you need.

If you have no square choose the straightest side of the piece of wood you are working and use a postcard to square up.

If you have no drill, burn your holes with a red-hot steel knitting-needle, skewer or poker. This is not accurate, but useful for many purposes.

To enlarge holes in cotton-reels either burn out or twist the square shaft end of a large file round and round in the reel until the hole is the size required, or use a rimer which can be purchased cheaply, or a round file. Glass-paper wrapped round a knitting needle will enlarge a hole slowly.

CHAPTER 2

WHEELS

WHEELS should always be made of sound, hard wood, free from splits or cracks. Beech and Birch are the best and Ash or Sycamore could also be used. They may be sawn from a board, by means of a bowsaw, coping-saw or fretsaw, or roughly cut with a tenon-saw and finished with chisel and rasp, file and glass-paper. If you mark your wheels deeply with spring compasses you will find it easier to cut a true wheel than if you mark with a pencil only.

The centre holes must be bored exactly or the wheel will not run true; the holes should be slightly (usually about $\frac{1}{32}$") larger than the axle on which they are to revolve.

If a bench drill is available the best method of making wheels is to use a tank-cutter, which is normally used for metal, but if ground as shown and used in a bench drill can cut wheels up to 5" diameter. It bores the central hole at the same time. It has the advantage over a lathe of speed and it also cuts the wheel from the flat board, which is better than a turned wheel. The cutter can also be used in a brace to cut wheels up to 2" diameter. (See page 15.)

Wheels 1" thick may be cut from an old curtain pole (usually 2" diameter). The method for finding the centre for such wheels is shown. (See page 21.)

VARIOUS METHODS OF FIXING: (*a*) SCREWS

Always use round-headed screws, never less than size 8 for even the smallest wheels. They should go at least $1\frac{1}{4}$" into the base (see note *re* fixing screws, page 12). Washers must always be used on both sides of the wheels. This is most important, as it stops the screw-head from wearing away the wheel and stops friction from the wheel rubbing on the base of the toy. Washers must fit easily but not loosely on the screw.

For small toys such as trains, when many wheels must run true on the ground, it is useful to have metal bearings. These can be made from strips of metal like that used for binding packing-cases. Cut this into ½″ squares and bend down the four corners with pliers. To ensure a central hole, bore the wheel hole first (slightly larger than the screw axle), hammer on a bearing on one side, turn over and putting your drill in the hole in the wheel, bore through the metal; repeat from the other side.

(b) TIN WHEELS

For this method either the lid or a whole tobacco or blacking tin can be used, into which a soft wood core is fixed with panel pins. This is the only occasion in which soft wood may legitimately be used for wheels.

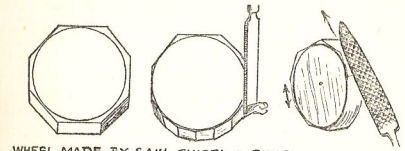
(c) DOWEL AXLES

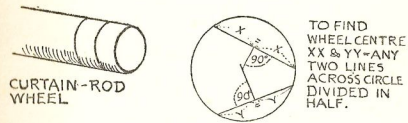
Two methods of dowel axle are shown; for smaller toys the ⅜″ dowel passes right through the base of the toy and for larger trucks through brackets or the extended side of the truck. Wheels are glued to the axles and are further strengthened by small panel pins driven in from two sides. An alternative method is to drive a tapered nail such as a tin-tack into the end of the axle, or to make a saw-cut in the protruding end of the axle and drive in a wooden wedge, in the same way as a hammer handle is fixed. Be careful to wedge ACROSS the grain of the wheel.

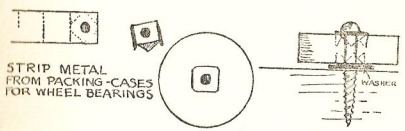
The axle should protrude ¼″ for appearance, strength, and ease of making. If several wheels are made by this method, it is worth while to make a jig as shown, from a piece of ¼″ wood (see page 23). For a ¼″ dowel bore a 9/16″ hole in the jig, grip this in the vice and all your axles can be sawn off accurately and speedily. Washers must be used between the wheel and the truck side.

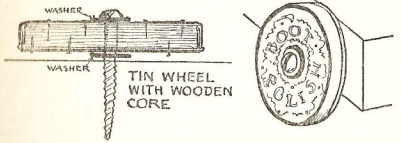
(d) WHEEL FOR BARROW, SCOOTER OR TRUCK

A ¾″ axle is used in this case, fixed to the barrow sides by means of a ⅜″ gas-pipe clip. These are screwed with 1″ screws to the hard-wood sides of the barrow and panel









pins are also driven through the clip into the axles. The 5″ wheel revolves on the axle and in the case of the barrow is prevented from wobbling by two 2″ circles or octagons, glued and nailed to the axle. These could be painted a different colour to the wheel.

(e) ECCENTRIC WHEELS

These are achieved by having the axle ¼″ from the centre of the wheel. Only one pair of wheels need be eccentric to give a realistic bucking movement to a toy rabbit or donkey. (See page 65).

(f) CASTORS

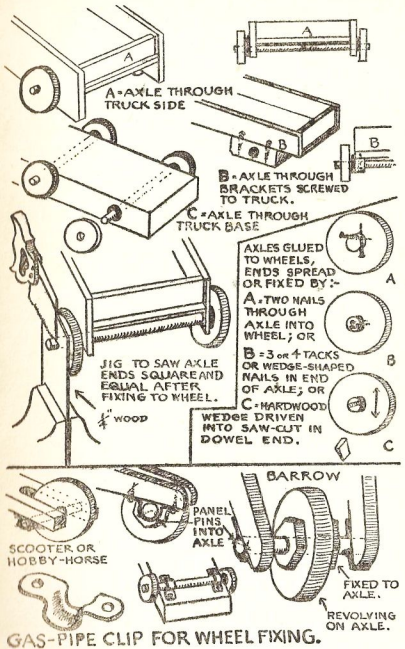
For the heavier type of toy, castors are ideal. If not available in the shops they can often be obtained from old furniture. They run so easily that it is desirable to fit the toys which have castors with buffers on all sides, to save walls and furniture from knocks.

(g) COTTON-REELS

These make quite satisfactory wheels for small toys. As more screw should go into the base of the toy than protrudes from it, No. 14 screws at least 3″ long are needed for the normal size 1¼″ reel plus its two washers.

(h) UNBREAKABLE WHEELS

No wheel can be absolutely guaranteed to be unbreakable, but these are most difficult to break. Made from large cotton reels or, for larger sizes, from squared timber planed to size required, they fix to the bottom of the toys. For the cotton-reels a ⅜″ hollow metal curtain-rod is cut with a hacksaw to the length of the reel, the centre of which has been bored to take the rod, fitting very tightly. This is hammered into place and the ends filed smooth and flush. A ¼″ metal stair-rod is used as an axle, with washers on either side of the wheels, the rod fixed into holes in strong brackets which are then screwed to the base of the toy. A larger rod should be used for larger wheels.



Supported as they are on either sides by brackets and with metal bearings, they are difficult to break.

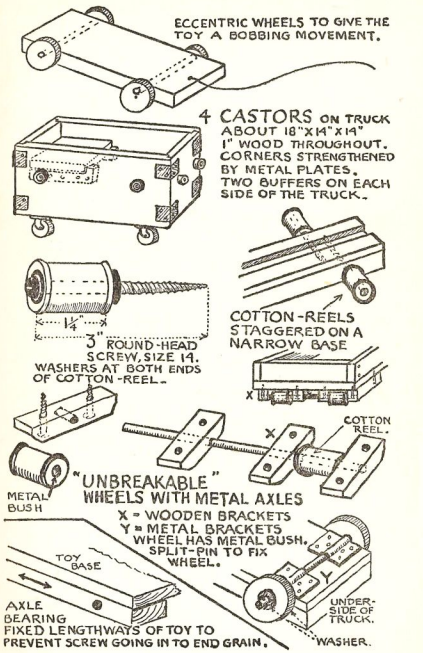
Another method—a metal axle held by metal plates is also shown. The wheels kept on by split pins.

(*i*) NAILS

It is often found that for the larger toys screws are unsuitable as the weight of two or three children on a cart will cause friction, resulting in the screws one side unscrewing and the other side screwing up. In these cases it is better to use large nails, the only suitable kind being galvanised roofing nails which have a head, and should be 2½" long. Make a hole in the base of the toy three-quarters the thickness and three-quarters the length of your nail, otherwise the wood will split when you drive the nail home. Don't forget the all-important washers on BOTH sides of the wheel.

(*j*) AXLE BLOCKS

It is always bad to screw or nail into end-grain, often worse in hard wood than soft and particularly is it bad to fix wheels to end-grain. Whenever possible fix your wheels directly to the base of the toy or to a strip screwed lengthways along the base; when screwing this into place be careful to stagger the screws so that they do not interfere with the wheel fixing.



COLOURING

PAINTING

PAINTING should never be hurried; if, in your enthusiasm to get on with it, you forget to do that extra bit of sandpapering, the finished toy will be only passable instead of really good. It is a mistake to think that anything will do for children; we want our children educated to appreciate well finished equipment so that in later life they will not put up with shoddily finished articles which have been made to do in the past. Get the best paint you can buy, for it pays to work with good materials. Be sure to avoid poisonous lead paints; white lead is fortunately not now easily obtainable. Buy any good quality, hard gloss or enamel paint that will finish with a really glossy surface; an outdoor paint stands up to harder use than an indoor one. If it is quite impossible in your district to get a glossy paint, consult your paint merchant or a house decorator, as to whether varnish is suitable to be added to the paint you are buying, and if not, you must varnish the toys after painting, for all Nursery toys must be washable and a glossy surface is vital for cleanliness. Copal or floor varnishes are good and what is known as " Clear Carriage Varnish."

Choice of colours needs careful thought. Don't buy too many. Much can be done with five colours, such as BLACK, WHITE, PILLAR BOX RED, CHROME YELLOW and a SKY BLUE. From these colours, by mixing not more than two at a time, many others may be obtained. White added to blues and greens will give some lovely light shades. Heavy browns and dark blues are too dull for small children.

Small tins of lacquer paint are useful for eyes and spots of decoration; they are still obtainable in many districts.

Three coats of paint are necessary, the first being a

white or pink undercoating or priming which prevents the wood from absorbing the oil in the following coats, which would cause the paint to dry in patches with a matt surface. If the wood has nail holes, etc., paint the bad places first then fill with putty, allow to dry, then undercoat the whole.

Don't paint too much of the toy at one time and think out the best way to hold it whilst painting so that the painted surface does not touch your fingers. Never stand a toy on a wet surface. All movable parts should be painted before they are put together and you will find all sorts of dodges for setting the painted pieces to dry, with wheels strung on horizontal pencils and parts with holes drilled, reared in mid-air on other pencils or bits of stick.

Work your undercoating well and evenly into the wood, this is one of the great secrets of successful painting. No amount of good surface painting can hide deficiencies beneath. When the undercoating is hard dry, glasspaper very lightly, using very fine No. 00 or two used pieces rubbed against each other, to get a really fine glasspaper surface. Then apply a coat of hard gloss paint, enamel or lacquer. When this is thoroughly dry and hard, apply your final coat of paint or varnish. If you add a coat before the first is set thoroughly hard, the undercoat may never dry at all, with disastrous results on all with whom it comes in contact.

TIPS TO GOOD PAINTING

(*a*) Don't plunge your brush into the paint pot; a good painter only dips in half way up the bristles.

(*b*) Stir your paint thoroughly, working the pigment up from the bottom. Stir energetically for three or four minutes, using a smooth, clean, stick, but never your paint brush.

(*c*) Strain your paint when you mix it or when it has got to the bottom of the tin, or been out in a jar for a day or so. An old silk stocking is ideal for

the purpose; the finer the better. Pour the paint through a piece of stocking about 6" × 4", allow to drain, finally squeezing the paint through by twisting the ends as though you were wringing out a cloth.

(*d*) Keep small jars by you for paint mixing. It is always better to work from a small wide pot, keeping your large tins closed, and always mix enough for the job to be finished.

(*e*) For large toys a good effect can be got by using two coats of grey undercoating, decorating a little with bright enamels and finishing with a floor varnish.

(*f*) For good hard woods, paint just the edges or wheels and polish the rest by brushing on a coat of white or French polish diluted with methylated spirit and finishing with any good furniture polish, which should be applied with brush or rag, left for half-an-hour, and then brushed or rubbed up well, or alternatively use two coats of a hard gloss varnish.

(*g*) Thin your paints if necessary with a half turps, half linseed oil mixture. If driers, such as jappaner's gold size or terrabin are used, they tend to take the gloss from the paint.

(*h*) If you want a decorative line it is easier to do a zig-zag or a wavy line than a straight one.

(*i*) Artists showcards' or poster colours varnished, although easy to use, are not suitable to the rough usage and constant washing needed for most nursery toys.

(*j*) Never mix two different TYPES of paint—such as cellulose with oil paint.

(*k*) For apparatus where sorting of colours is involved, choose your colours carefully, making sure that you get sufficiently contrasting shades for a very young child to pick out. Some pinks and oranges may be confusing, or blues and greens too near one another in tone.

(*l*) When leaving your paint for some time, pour a little turps on the top before closing the lid; this prevents a skin from forming and can be poured off before using again. Close the lid tightly—hammering it on if left for more than a day.

DECORATION

A very quick way of decorating figures if they are made of unblemished wood, is to size or spirit varnish them, then outline features, clothes, etc., in coloured paints. The whole process may be done in one evening, instead of taking several days which must be allowed for the usual three coats of paint. The figures should be finally polished or varnished. Another quick method is to stain all one colour and paint features on top of the stain.

Do not try to be naturalistic in decoration, various ideas for wings and flowers are shown, formalised but suggestive. A brush gives an easy flowing line if you let it guide your decoration, rather than trying to force it to copy laboriously a formal pencilled pattern. (See page 85.)

CHOOSING YOUR BRUSHES

It is worth while spending some time hunting out really good brushes. Coarse ones are no good to toy-makers and flimsy ones, liable to curl, no good to anyone. Try to get the following :—

$\frac{3}{8}$" and $\frac{1}{2}$" FLAT, ONE STROKE OX HAIR BRUSHES,

No. 3 and No. 5 SABLE BRUSHES, for details.

CLEANING YOUR BRUSHES

Brushes are difficult to get and so easily ruined by carelessness and being allowed to cake hard. Cleanliness is absolutely essential for good work. Wash brushes very carefully in turps or paraffin and clean thoroughly on a rag. Repeat this at least twice.

Hot water and soap is also good for cleaning brushes while they are still soft, but not if the paint has been allowed to harden.

STAINING

For nursery use a stain is often much preferable to paint, although it has a rather more limited use. It has the great advantage of not chipping or flaking off and will only wear off as the wood itself loses its surface with constant rubbing.

A really good make of stain, usually bought in powder form and mixed with ⅔ methylated spirits and ⅓ spirit varnish has proved very successful for staining new or clean wood. It is very much speedier, and cheaper than paint. Water stains are not very satisfactory and will bring up the grain of the wood, necessitating further sandpapering. We experimented in the Nursery School Association workshop by sucking for two hours part of a toy dipped in ⅔ spirit stain and ⅓ spirit varnish. No stain came off at all, so we considered it good enough for nursery use. It is really advisable to use a similar test to any toy that is at all likely to be put into a child's mouth., If any stain at all comes off when sucked use a better stain or add more varnish.

Stain may be brushed on or dipped. For a number of small pieces, a wire or string mesh may be used, but it is essential to keep one mesh for each colour, as it is practically impossible to clean them completely. It is better also to keep special brushes for staining. These need only be wiped after use, or else cleaned extremely carefully with methylated if they are needed for other colours.

After dipping, be careful to let the pieces drain well, brushing off the final drips before placing to dry, or else you will get blotchy colouring. Small pieces with holes in them are easiest hung on knitting needles or rods to dry. Only rest the pieces on their corners or edges, never lay them down flat or they may dry blotchily.

Nursery toys must have a polished surface for cleanliness, so either give the toys a coat of varnish, or polish them with a good make of colourless furniture polish or wax. Put this on evenly and sparingly with a soft rag

or brush, leave for twenty minutes, then brush thoroughly or rub with a cloth.

Stains are suitable for colouring animals or figures, if the features and details are put in with oil paint or enamel. In this case leave the paint to dry for two days before putting on polish gently with a rag. Rub up the polish with a rag, and never brush the painted parts. Eyes may be effectively suggested on stained animals by drilling ⅛" hole after staining.

The only satisfactory way to use two coloured stains on the same piece of wood is to score a line very firmly with your marking knife, where you wish the colours to meet. Allow the first colour to dry thoroughly before putting on the second and use your brush practically dry where the colours join, so that a flood of stain does not rush down the grain of the wood where it is not required. It will tend to do this more readily in soft than in hard wood (see p. 79—primitive train).

You will have to experiment as to quantities for mixing your stains as they vary very considerably in strength. Stains of the same make were mixed in the following proportions to get good bright colours.

RED—6 level teaspoonfuls stain to 1 pint methylated and ½ pint spirit varnish.

YELLOW—4 level teaspoonfuls stain to 1 pint methylated and ½ pint spirit varnish.

BLUE—¾ level teaspoonfuls stain to 1 pint methylated and ½ pint spirit varnish.

Green, brown, black, purple, etc., may be easily mixed with a little judicious juggling.

Always stain parts before putting them together as the slightest trace of glue or grease will prevent the stain from sinking into the wood. Whenever possible avoid staining joints and axles which have to be glued, as the varnish in the stain does not make a good surface for gluing. For the same reason always polish AFTER putting your toy together, as the glue will certainly not hold to a waxed surface.

PRECISION TOYS

ROUNDABOUT (A)

This is the sort of toy which should certainly not be slavishly copied, but worked out, allowing your imagination and sense of colour full scope, for roundabout animals are conventional in design and traditionally flamboyantly gay. Let yourself go!

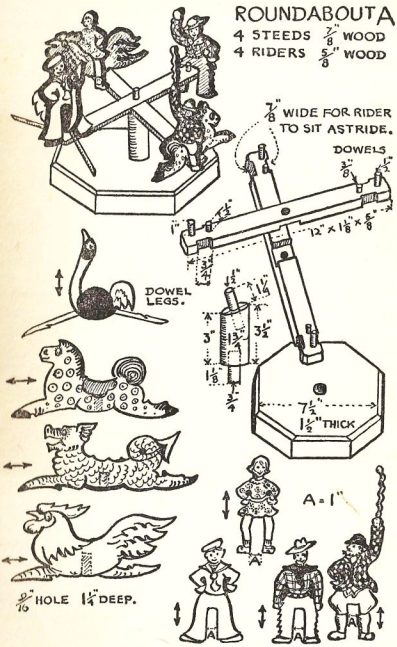
Be careful in studying the grain of the wood; the two sketches of cocks (see page 9) show the different treatment necessary for maximum strength, using opposite ways of the grain.

The angle of the top of the upright is important, and if well wax-polished or rubbed with a candle, the figures revolve easily, with an up and down movement. Relative sizes of the figures are important, so that they fit tightly enough to stay on their steeds while revolving but not too tight to scrape off their paint. The width between the legs and the position of the pegs on the cross pieces will vary according to the thickness of wood used.

If you make all the figures to stand, they will have an added use and it is surprising the number of different ways in which they can be placed on the roundabout.

ROUNDABOUT (B) (Page 37)

This type will give you a set of Noah's ark animals which can be played with apart from the roundabout. Nail as well as glue the strips of quarter-inch wood into which the figures fit. It is best to cut figures and strips from hard wood. Paint the top sides only of the circular discs, and stain and polish underneath, to prevent the painted surfaces rubbing against each other. If you decide to put figures round the top, make them quite small and squat or the toy will look too fussy. It is important to nail the disc or a square piece of wood to the top crossbars of the base so that the large disc revolves easily and the crossbars cannot tip. These must protrude at least 1" beyond the revolving disc, for picking-up purposes.



ROUNDABOUT (C)

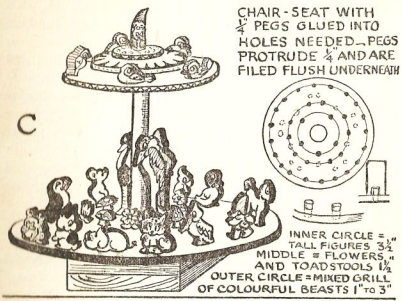
This is a " Utility " model of (B), using an old chair seat for the large disc. The holes in a ply seat are almost invariably $\frac{1}{4}$". Putting a figure on each hole (there are usually about forty) makes the roundabout too fussy, so eliminate one circle by filling up the holes with very tightly-fitting pegs glued in and filed flush or else leave the holes plain and unfilled. The remaining holes should have a short peg protruding $\frac{1}{4}$", the figures to fit on them having holes slightly larger. Stain the pegs in circles of different colours and paint the seat green or some neutral colour. Stain the top discs and paint the figures and decorations.

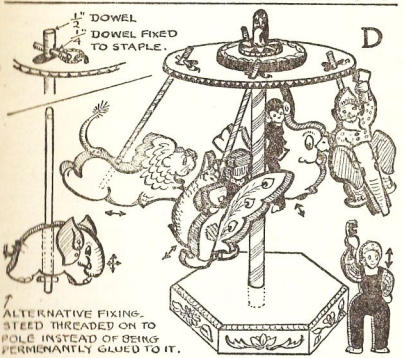
An effective arrangement can be made with 5 tall figures nearest the pole, next a row of 10 small flowers, mushrooms or birds, using two colours only, which can be interchanged with the 5 tits or robins from the top-deck, and finally the outer circle, a riot of colours with animals which can be matched up if desired, just to make it more interesting: i.e. grey donkey and elephant; pink parrot and pig; ginger cat and squirrel.

The base should be thick enough for hands to get beneath the disc easily, for lifting; it can be a solid piece or two or three layers of thinner wood.

ROUNDABOUT (D)

This uses the same type of figure as (A) but is constructed more or less like (B). The people are removable as before, but $\frac{1}{4}$" dowels are glued into the animals and fit into a disc at the top of the roundabout by means of $\frac{1}{4}$" pegs which should be attached to the disc to avoid losing them. Make the slot into which the poles fit the shape indicated, so that the steeds when revolving swing outwards but not sideways. Leather and fur tails and ears will swing out nicely.





POSTING BOX OR BOARD

THIS is best made as a box, using the board as a lid, with strips nailed on the underside, to fit easily inside the box rim.

The design shown is easier to make and saves wood and has the advantage of allowing the pieces to be posted horizontally and watched, as well as vertically; but it requires a bag to hold the pieces.

The box must be deep enough for two pieces to be posted on top of one another with a clearance of $\frac{1}{8}$" from the lid. The board can be made of $\frac{1}{4}$" three-ply the holes fretted out, or from $\frac{3}{8}$" wood cut with a coping saw blade fitted into a fretsaw. File the holes true.

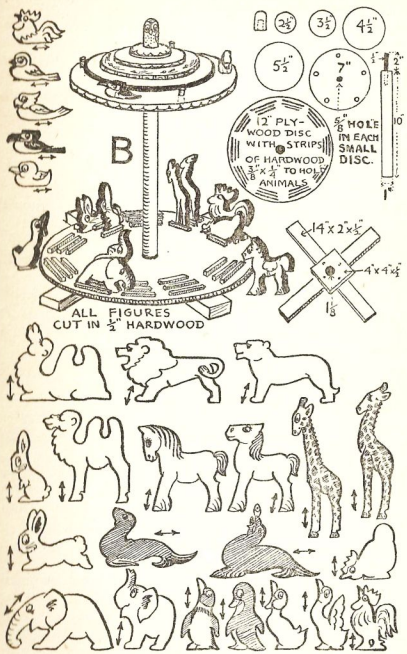
Another method is to drill fine holes in the corners and chisel the shapes out carefully, finishing with a file. This is a very good test of accuracy as sizes of holes and pieces must be exact so that no piece will post through a wrong hole.

Hard wood for the pieces should be used, these can be either painted, or stained and wax polished. You may colour one complete set of shapes one colour and another set a different one but you should not help the child to sort out pieces by colouring the two square bits blue and two triangles red and so on.

HAMMER TOYS

When the London firemen made some of these for the nurseries they called them "loony-toys" because you hit the pegs through, then turn the toy over and hit them back again until tired. In the nursery, however, they are among the most popular and useful pieces of equipment, giving a safe relief when a child wants to hit something or to copy a grown-up with a real hammer. They are one of the more difficult toys to make, requiring a perfect fit to be of any use at all, but very worth while to take a little trouble with.

Hard wood, such as beech, should be used for the



SEE PAGE 32

board, pegs, and hammer head. As standard dowels vary slightly, make the pegs first, cut the saw-cuts in them, using a very fine saw (note that the cuts overlap $\frac{3}{4}$" and are at right angles to one another), then drill the holes in the board, using a " bit " $\frac{1}{64}$th smaller than the pegs, which have to be hammered in hard but not so hard as to split the wood. When hammered flush with the board, the pegs should be $\frac{1}{16}$" clear of the ground on the other side.

The hammer-pegs may also get used wrongly as a seat, so glue on the sides as well as nailing them, and further strengthen with dowels.

The handle should fit at least $1\frac{1}{4}$" into the hammer-head ; glue and nail this also ; it will get a lot of hard use.

If after a long time in the nursery, the pegs work loose, they may be tightened by springing a piece of thick rubber band into the slot.

The semi-circles cut from the side pieces are essential for easy aiming with the mallet.

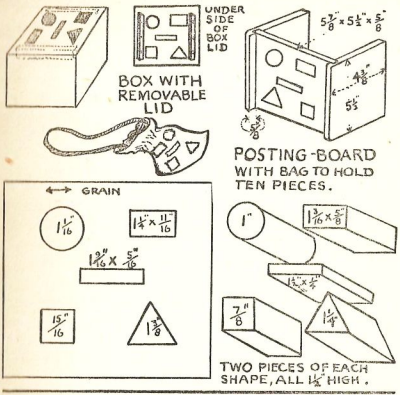
GRADED CIRCLES

These can be made using a very coarse fretsaw (No. 6, or a fine coping saw blade). The hole should then be slightly enlarged and the circle made perfectly accurate with a file, so that the circles fit equally well in any position.

An easier method is to use a tank cutter (see pages 15 and 19). If you use a cutter $\frac{1}{8}$" thick it will cut a disc which should exactly fit the hole next to it, leaving the largest hole to be cut from a separate piece of wood.

The circles should fit easily and not be painted round the edges, as this would just wear off. All the circles should be the same colour, so that no confusion arises in the child's mind as to whether size or colour is to be sorted.

Graded triangles, squares, hexagons, or other simple shapes can also be used. These must be fretsawn.



GRADED CYLINDERS

This can be made by drilling right through the wood and nailing a strip on the bottom. Cut your pegs all the same length, saw them in two, grading the sizes $\frac{1}{4}$" each time and glue one part of each peg into the bottoms of the holes.

A more economical method is to mark your " bit " in quarter inches, and by careful watching you can grade your holes accurately, starting with the smallest hole.

The cylinders must fit easily and must be a full $\frac{7}{8}$" diameter (in a 1" hole) to allow for those placed incorrectly to be retrieved. Use stain and polish; or if paint is used, paint only the top of the cylinders all one colour. Wooden pegs or staples may be used to lift out the cylinders.

PYRAMID OF GRADED RINGS

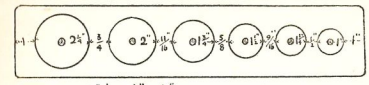
These can be cut using a tank-cutter in a bench drill (see page 19 *re* wheels) or somewhat more laboriously, with a bow-saw, finishing with a rasp, file and glass-paper. In this case mark out the circles deeply with spring compasses, to ensure accurate cutting, and drill the central hole before sawing out the circles.

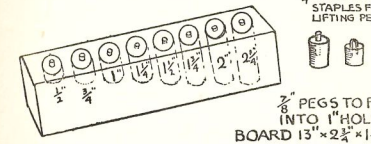
Graded squares may equally well be made and would be much easier to do, if no tank cutter is available.

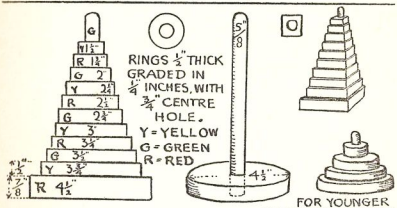
For the one-year-olds a sturdy, easy-fitting pyramid of four rings, with a size variation of $\frac{3}{4}$" is useful to make.

PEG BOARD FOR THE UNDER-TWOS

This is designed to satisfy the under-two's very strong desires to fit things into holes. The pegs are $6\frac{1}{2}$" long, 1" thick, and spaced so that a small fist can grip right round them in the board, which should be made from 2" wood, so that holes $1\frac{1}{4}$" deep may be drilled in it. If only the middle portion of the peg is painted, there will be no paint to be rubbed off when thrust into the holes and if the ends are left well sand-papered but unpolished they may be sucked with little risk of paint reaching the child's mouth.







Colour the sides of the board but not the top or bottom, as they will get rubbed or battered about with badly aimed pegs.

MOSAICS

A really useful mosaic for a four-year-old can be cut from timber $1\frac{1}{8}'' \times \frac{1}{2}''$, using a mitre-box and measuring extremely carefully (see page 15). Smooth the corners and edges of all the pieces and see that they fit loosely into their lidless box with $\frac{1}{8}''$ play. The mosaic shown, if painted on both sides, will give the maximum colour and pattern combinations possible. This is a little troublesome to do but is a really worth while and interesting piece of apparatus when finished.

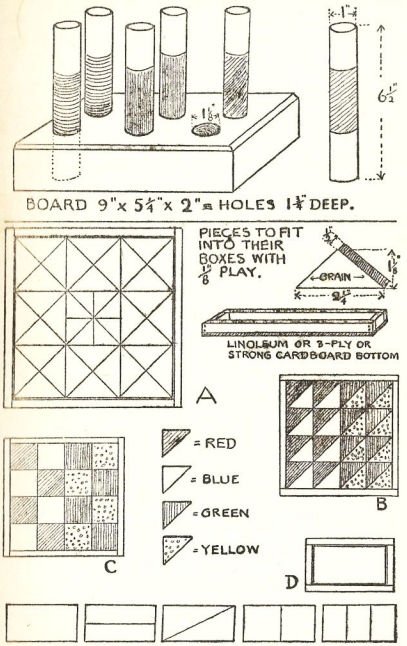
Number of Pieces.	Number of Half Pieces.	Top Colouring.		Bottom Colouring.
5	2	red	&	blue
5	2	red	&	green
5	2	blue	&	yellow
5	2	green	&	yellow
4	4	red	&	yellow
4	4	blue	&	green

(B) A mosaic for three to fives can be made of 32 pieces stained red, yellow, blue, green, using the same-sized timber as above. A great many patterns and colour combinations can be made, though it has not the full range of mosaic (A). Diamonds, squares, small triangles, can, of course, also be used for pattern making.

Keep your colours clear and bright and use hard wood if possible.

(C) For younger children 16 square pieces—4 red, 4 yellow, 4 green, 4 blue.

(D) This is a mosaic for the 2-year-olds, made from 3-ply or hard wood coloured all one colour as the child is concentrating on shapes, not colour. Pieces fit easily into a rectangular box, which is an essential part of the apparatus.



HEXAGONAL MOSAIC

The pieces may be made from one inch discs turned on a lathe or made with the tank-cutter from $\frac{3}{8}$" wood. These should have a peg which protrudes $\frac{3}{8}$" on either side which will give the added attraction of being usable as tops.

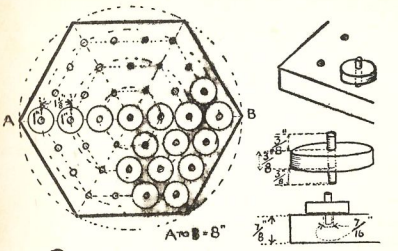
If cotton reels are used and the $\frac{5}{16}$" peg glued in to only half the reel length, it is possible to build up the entire boardful of reels into quite a sturdy tower which often proves more intriguing than making patterns; or even more attractive, the reels may be made into one long snake.

The grain of the wood must run parallel with the sides of the board, not at right angles to A—B. Space the holes $\frac{1}{8}$" further apart than the diameter of the discs or reels used; these holes should be $\frac{1}{16}$" larger than the pegs, to allow a loose fit. Do not drill the holes right through the board as this will weaken it considerably. Hard wood is best to use, but not essential.

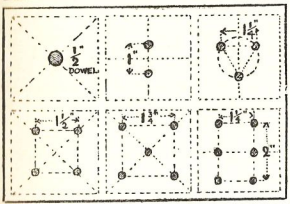
Use bright colours, contrasting in tone, so that they are not easily muddled by three-and four-year-olds. It is better not to use green and blue, or red and orange on the same board for this reason. If stains are used, colour 20 Red—12 Green—12 Yellow pieces. This number will allow for possible and highly probable losses and vastly increases the range of patterns which may be made. A bag should be made to hold all the pieces when not in use.

If the 1" discs are used and painted as follows, it is possible, if desired, to eliminate one colour entirely and give the maximum pattern range possible.

Top.		Underneath.	
15 RED	&	BLUE	(12 & 3 spares)
15 RED	&	YELLOW	(12 & 3 spares)
15 BLUE	&	YELLOW	(12 & 3 spares)
2 RED	&	BLACK	(1 & 1 spare)



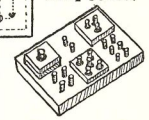
COTTON-REEL MOSAIC. SIMILAR BOARD TO ABOVE. $\frac{5}{16}$" DOWEL GLUED INTO EACH REEL, HALFWAY ONLY, SO REELS MAY BE BUILT UP IN TO TOWERS.



NUMBER SORTER. BOARD $10\frac{1}{2}$" X $7\frac{1}{4}$" X $\frac{1}{4}$" WITH $\frac{5}{16}$" DOWELS PROTRUDING 1"

SQUARES HARD WOOD 3" X 3" X $\frac{1}{4}$" WITH HOLES $\frac{7}{16}$" NO: 1 HAS $\frac{5}{8}$" HOLE FOR $\frac{1}{2}$" DOWEL.

2 OF EACH NUMBER IF MEASUREMENTS ARE FOLLOWED NO SQUARE CAN BE PLACED INCORRECTLY.



NUMBER SORTER

This must be made very accurately as none of the squares should be able to be fitted on to the wrong pegs in any position. You can not have a smaller square and achieve this, as the holes must be really loose. It is not an easy operation to fix the higher numbers on to their five or six pegs all at once. $\frac{7}{16}$" holes should be made for $\frac{5}{16}$" pegs.

To mark out pegs and holes exactly, make a cardboard template very carefully and prick through the pattern on to the wood. It is also important to drill the holes dead upright.

Stain the board one colour and the pegs another colour as an aid to quick recognition of the groups of pegs. The squares could be left plain polished wood. Do not make the mistake of colouring each pair of numbers a separate colour, this is a shape not a colour sorting apparatus.

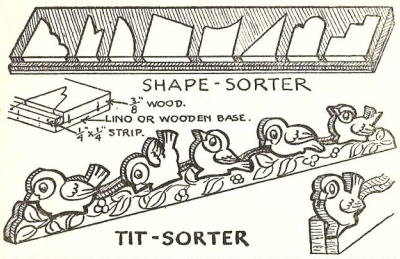
SHAPE SORTER

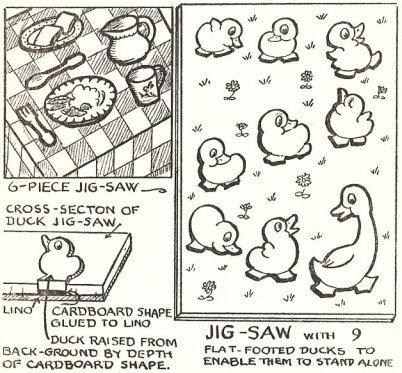
This is one of the few types of jig-saw which may be cut with a coping-saw and for which plywood is not essential.

Design your shapes so that they fit one way only, as this is better training in judgment than even sided figures and is incidentally easier to make. The pieces should be polished and only the shaded parts of the surround painted (see diagram). This will throw up the pattern of the cut-out shapes, and no part is painted which will rub against another part. The front strip is added, as the polished pieces have a tendency to shoot out on the floor every time they are picked up.

TIT SORTER

This is a variation, requiring a fretsaw to cut it out ; it serves a double purpose as decoration on a nursery ledge as well as a sorter of shapes and sizes. In this case the birds must be painted, but only on one side and not at all round their bottom edges.





JIG-SAWS

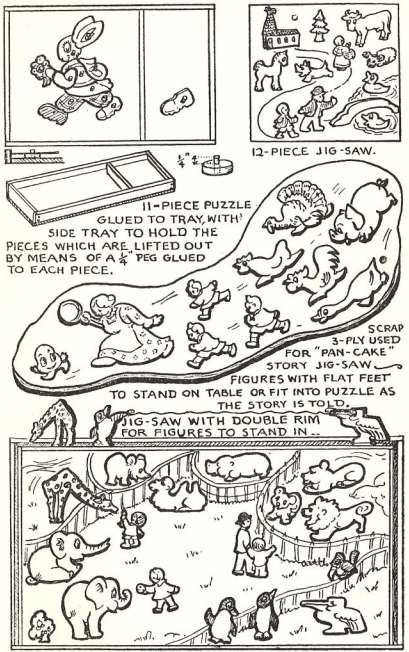
Clear, simple pictures must be used for jig-saws; and none of the pieces should have sharp corners or thin waists. Eight to eighteen pieces are enough. Suitable suggestions are shown; the table and zoo pictures being useful both for speech training and finger manipulation. 10″ by 15″ is the maximum size a child can manage without eye-strain.

These types of jigsaw need a permanent back which can be made from very thin three-ply or scraps of thick linoleum, which should be glued on and tacked carefully. Trace through your cut-out picture on to the back of your lino to make sure where to put the brads in the weakest and most vital points. Pegs are needed to lift out the pieces, preventing the necessity for turning the puzzle upside down to throw the pieces out before the picture can be built. Put your peg holes in, before cutting out, and glue in the pegs, as however tight they may appear to start with, they will work loose later.

Another better method, making pegs unnecessary, is to tack on a piece of $\frac{1}{8}$″ thick cardboard to the back of your puzzle and fret out the two together. Then remove the card, fix the back to the jigsaw, and glue the cardboard shapes into their correct holes. This will raise the wooden pieces to be fitted in, sufficiently for them to be picked out easily. (See page 47.)

Zoo and animal puzzles made in this way, with all the animals designed and carefully cut so that they will stand, can be used also in other games. A double rim, so that they can be set up all round the jigsaw, is also an attraction.

A tray at the side of the puzzle is a great help in keeping the pieces from getting lost or muddled up with another child's apparatus at the same table. The raised rim of the tray will save the pictures from getting rubbed when stacked away in a cupboard.



GRADED STAIRWAY (A)

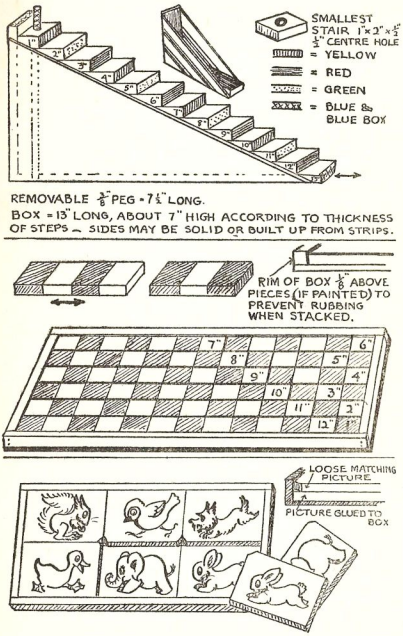
This is a good toy for length and colour sorting and also for using as a spiral staircase. There are 12 pieces 2″ wide and ¼″ thick, varying from 1″ to 12″ in length. Suggested colouring: Nos. 1—4—7—10, Yellow; 2—5—8—11, Red; 3—6—9—12, Green; in a blue box, the base of which should be 13″ long and 1″ thick so that the ⅜″ pole which threads through all the pieces can stand steadily without wobbling. This peg must be loose, as usually the lengths are pushed in from the front of the box, and the peg threaded down at the finish, but it should be possible to drop them on from above. For a ⅜″ pole the holes in the movable pieces should be ½″.

It is possible to vary the use of the stairway, by colouring the lengths in two colours only, marked off in inches.

(B) This is another variation on the same theme using strips, 1½″ wide and ⅜″ thick; 1″ to 12″ lengths are again used, each inch scored round with a marking knife and a try-square, alternate inches being stained in red or yellow. Normally used for length sorting, packing into a box as shown is an added use for the toy which can be used in a great number of ways, including the first stages of arithmetic.

MATCHING PICTURES

If you do not feel like painting your own pictures, buy two cheap picture books, an A.B.C. book is often good. Cut out carefully the picture only—no lettering—and paste on to thick cardboard or 3-ply about 3″ × 4″. If you choose animals, pick out those a young child might be expected to know, elephants and dogs rather than yaks and jaguars. A set of eight or twelve pictures glued in a tray is good, be sure to make the rim of the tray deep enough to take the second picture, and cut the inner corners from the matching set, so that they can be easily picked up when all are in place. They can be just as effective if kept in a box and played with loose on a table, anything up to 20 pictures can then be used.



They are a useful help to speech training so choose your pictures judiciously.

CONSTRUCTIONAL ENGINE

This serves a double use as a precision toy and a useful pull-about engine. The design may vary but he main simplicity of construction should be maintained. Holes must be very accurate and vertical and the pieces fit easily on to their pegs with $\frac{1}{16}$" play so that they cannot jam.

Wheels should be of hard wood and if fixed with screws, these should be at least two inches long.

Make the pegs equidistant so that the parts are interchangeable, thus giving an added test when putting the engine together. Six or seven parts are enough, and even if all the parts are eventually lost the trolley is still a good toy. A hook at the back, as well as the towing cord, is useful for towing other wheeled toys.

CONSTRUCTIONAL SHIP

The same remarks apply to the ship as to the engine. Care must be taken that all the pegs fit easily into the holes.

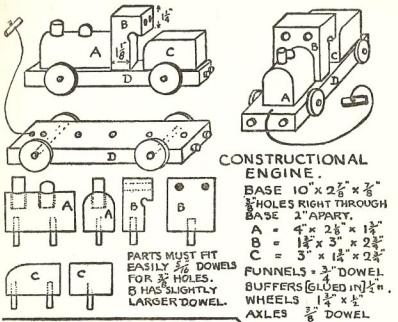
Cut out the three decks from hard wood, $\frac{5}{8}$" thick. Do not saw up the top deck, but drill the holes for the pegs and peg the three decks together, grip in a vice and shape the whole boat at once with smoothing plane or spoke-shave or rasp and file.

The bottom of the ship should then be shaped and the top deck cut into its four parts. Masts and funnels should fit really easily into the top deck and the two ends of the deck should have equidistant holes so that they can be put on either end.

CONSTRUCTIONAL MOTORS

With the pieces shown four different cars and lorries may be built up. They should be so designed that most parts will serve for two or three different vehicles.

Hard wood should be used for the bases and the



slotting parts, These slots in the car bodies are made by first drilling a hole at the end of the slot, sawing two cuts at an angle of 60° and a third cut down the centre; this cut helps to make the chiselling out of the wood easier, and prevents the likelihood of the edges (A) from being forced off.

It is possible to make this toy like the constructional ship or engine, but a sliding fitting is more difficult so should appeal more to the four-year-olds.

The size of these cars is immaterial and can be made quite small, with a base 6″ × 2″ or larger size, about 9″ × 3″.

CONSTRUCTIONAL BEASTS

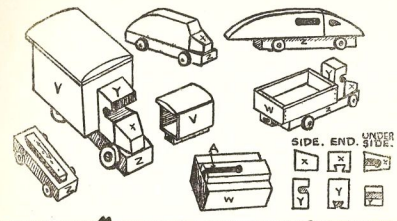
These form an intriguing game of manipulative skill which give great scope for imagination and fun, both for the nursery children and the original makers of this educational zoo.

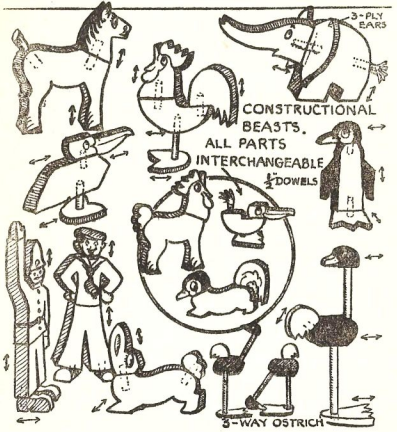
A set of at least six should be made, keeping the same-sized dowel throughout, so that parts may be interchangeable and strange new beasts evolved according to taste.

The pegs should not be painted where they fit into the holes, as this will soon wear off and in any case will soon work loose. Design your creatures with this in view, so that they will hold together with very wobbly pegs or even with none at all, relying on the laws of gravity.

Be careful to cut your beasts with the grain of the wood going DOWN the weakest parts, that is, down beaks, feet, and ears, and not across them. Make the feet flat and square so they do not easily topple over.

It is possible with care and using the stain brush as dry as possible to stain your constructional beasts, only using paint for the eyes and such parts as the cock's tail. In this case leave the paint at least two days to dry quite hard before polishing the whole creature. Legs may be stained and still fit easily into their holes which is an advantage. Polish and rub up with a soft rag, not a brush.





MISCELLANEOUS TOYS

BEDS

THESE must be strong enough for a child to sit, stand, or even to jump on, as they are rarely used for dolls alone. The type of bed with slats across the bottom is a constant source of trouble as it will sooner or later get trodden or sat on and is bound to collapse.

The sketch shows a really strong type of doll's bed put together with screws or nails or dowels, as well as glued, jointed and strengthened with side supports. A bed made thus should be almost unbreakable.

It should be at least 15″ × 8″ and a wooden box will do very well if it is strengthened with additional nails and is well glass-papered and painted. Blocks or cottonreels may be screwed at the corners to form feet, but this is not vital.

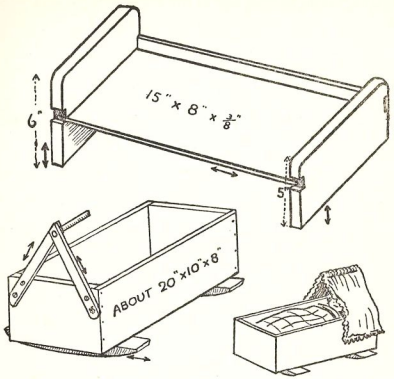
Provide ample bedding which should be large enough to tuck in really well. Make removable pillowcases for washing and also give the children shawls in which they all love to wrap their dolls and teddy-bears really tightly and securely. The minimum bedclothes needed are these: mattress, 2 sheets, blanket, pillow and pillow-case and gay bed-cover.

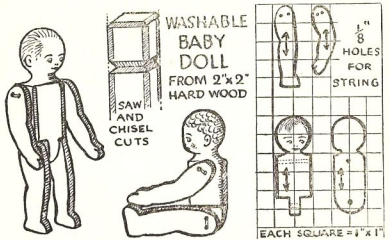
A simple type of cradle is also suggested; this must, like the beds, be strong enough for a child to rock itself on as well as the dolls!

WOODEN DOLL

The wooden doll has returned to the nursery after years of absence. It is an almost indispensable substitute for the now unobtainable china doll who could be washed and scrubbed. For this reason it should not be painted at all but the features burnt on with red-hot skewers or knitting needles.

The doll MUST be made of hard wood; note very carefully the direction of the grain in the limbs. It would be fatal to make them with the grain going across, not down the arms and legs.





Make the string holes at least $\frac{1}{8}$" so that they may be easily restrung and do not string them so tightly that the doll cannot sit down or raise its arms above its head. For neatness, knot the string between the body and the limbs, or use elastic.

The head may be circular like the old Dutch dolls; this is done mainly with rasps and finished with a file, or by the following method:

(1) Saw 8 saw cuts, $\frac{3}{8}$" deep for the neck, chisel out and finish with a file.

(2) Saw off surplus corners all round head and round off with a rasp.

(3) Shape the face slightly, if desired.

(4) Finish all parts very smoothly with a file and fine glasspaper. An extremely smooth surface is essential for a doll which is to be scrubbed.

DOLL'S HOUSE

A normal doll's house is useful but it is considered better for a nursery to have a doll's house which may be built up from four or six boxes (9" × 9" × 15" is quite a good size to work on), so that a child may take one or two boxes to play with alone. A doll's house is rarely a collective toy, especially not for a four-year-old.

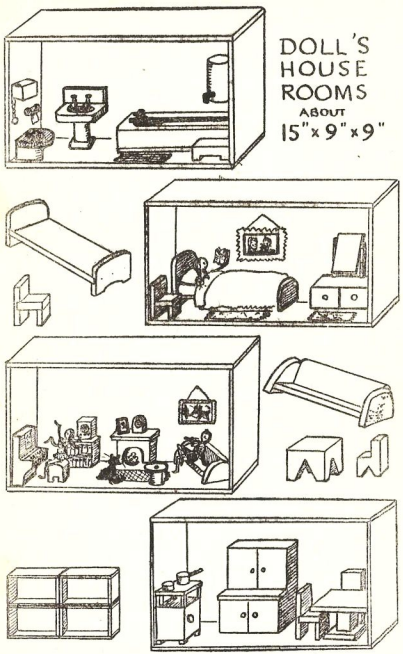
Furniture should all be strong and not at all fiddly and easily knocked over. It can all be made of scrap, our friend the cotton-reel proving useful once more. It is a mistake to think that doll's house furniture will not be submitted to as much strain as any other nursery toys; it should be able to be trodden or sat on with impunity.

Hinges to cupboard doors are pleasant but not really necessary, if you do put them on, get really good strong ones or put on good thick leather hinges, well nailed and glued.

People your rooms with wire dolls (see page 116).

SHOP

This will give endless pleasure to small children, boys as much as girls. The type of market stall suggested



can be dismantled as in real life. The parts fit into the box-stall.

A number of small coloured blocks, tins and cotton reels, make up the various stands; the tins can hold the goods when not displayed. Make two or three sets for each stall so that either a toy shop or a draper's or grocer's or flower stall may be set out. The children will add plenty of ideas of their own. Divide your box-stall into compartments to hold the different shop materials with a space to hold the poles and awning.

A dresser with hinged or sliding door, or a more realistic shop front would also be good to make if you prefer, but the market stall is the most economical for timber. If a sliding door is made, this should slide right out and fit very easily: if hinges are used the least breakable way is to put them on the bottom so the flap drops flat on the floor.

Make some of the articles to hang, with big enough hooks or loops for small fingers to manage without undue fussing.

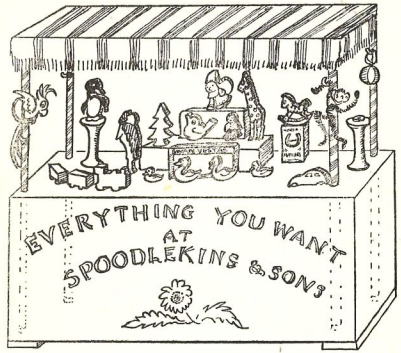
Paint your stall a light buff or pale grey and your fittings as bright as possible. "Barber's pole" decoration looks good.

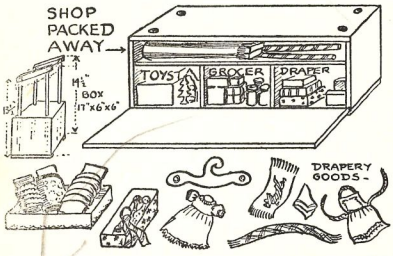
VILLAGE

Any workshop waste wood can be used to build towns, farms and villages. A set for table play with houses $2\frac{1}{4}'' \times 1\frac{1}{2}'' \times 1''$ and a set for floor play $4'' \times 2'' \times 2''$ are two useful sizes to make. All sorts of odd shaped pieces of wood and also bricks can be used and added to the set from time to time.

It is not essential to have dowels for the roofs, but if you do, keep them all centralised so that any roof will fit any house and vary the colours of houses and roofs as an added interest for the child in trying out new colour schemes.

The fir trees are shaped with a triangular file or a chisel and you will find it easier to hold if you shape your tree before cutting it the correct length.





Make traffic signs for your village so that the children may learn from play the essential rules of the road.

A simple type of village may be made quite quickly from $\frac{1}{2}$″ or 1″ scraps of wood; the shapes of houses, churches, etc., cut out in silhouette. If details are outlined in Indian ink, they can be filled in speedily with coloured stains or inks and finally wax-polished.

FLOATING TOYS FOR WATER PLAY

All parts should be glued as well as nailed, using preferably a waterproof glue. Design your water toys with as few pieces as possible to be joined; fill in all cracks with putty and give three coats of paint. Try your toys in water before you paint them to make sure they will float evenly. Dry thoroughly before painting.

TUG

Note the angle of the slope of the back of the tug, which is important for level floating.

DUCK

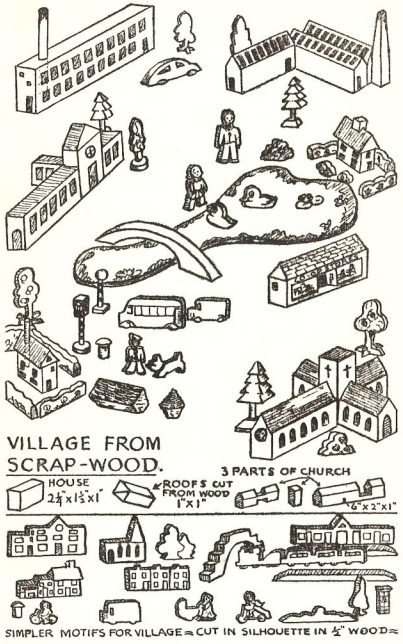
A larger head than this will tend to make your duck float upside-down. The bored-out eye helps to lighten the head and give a liveliness of expression when the duck is bobbing about in the water. The hollow of the back can be shaped with a half-round file.

PICTURE BUILDER

This is very popular, especially with the small boys.

Pictures are built up with small pieces of coloured hard wood $\frac{1}{4}$″ thick, in which holes have been drilled to take $\frac{1}{2}$″ brass brads easily. To avoid splitting, drill the holes before cutting out the pieces and if you follow the shapes suggested really interesting pictures can be evolved, the cut-up oval shape giving much more variety than if just triangles and squares and circles are used.

The hammering board is two thicknesses of Essex or similar fibre board, about $\frac{1}{8}$″ thick, two pieces at least should be supplied with the game, as the board has to be soft enough for the nails to be knocked in and hoiked



out easily and can not be expected to have a very long life.

A small size plaster tin with a hinged lid makes a good holder for the brads, this should be nailed to the tray which holds the wooden pieces. An even simpler method is to nail two tins and the fibre board to a $\frac{1}{2}$" wooden base, leaving a space between the tins to hold the small wooden hammer and the " Flipper " which complete the outfit. The " Flipper " is for easing up the pieces ready for the next picture and should be made of hard metal at least $\frac{1}{2}$mm. thick, of which all edges have been thoroughly well filed and rubbed smooth with emery cloth.

WHEELED TOYS

To make flimsy wheeled toys is a waste of time and materials, but a solidly made pull-along toy has a definite place in a nursery. Suggestions are given for suitable types to make ; these are so constructed that the grain of the wood runs DOWN not across legs and arms and other weak spots, and with bases wide enough to avoid the risk of the creatures toppling over when towed speedily.

DONKEY

Has a bright saddle of leather, and leather tail and ears, all glued as well as nailed in place. He also has eccentric wheels, the axle of which runs right through his base, so that he bucks in truly donkey fashion.

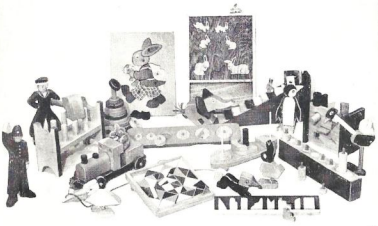
HORSE AND CART

The little cart has a horse which pivots on an axle running through the shafts, and so bucks as he is pulled along. A rabbit or a duck or a dog could be used here equally well. Thickness of wood is important here for strength. Cart sides $\frac{1}{4}$", ends $\frac{1}{2}$", bottom $\frac{5}{8}$", and horse $\frac{3}{8}$".

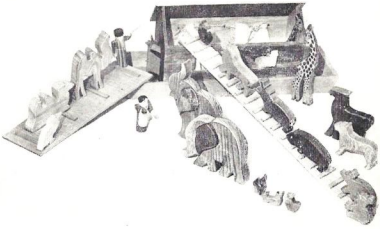
DUCK TROLLEY

This is another type of toy in which you can let your imagination run riot. Any set of four or five animals

ROUNDABOUTS
Pages 33, 37, 57

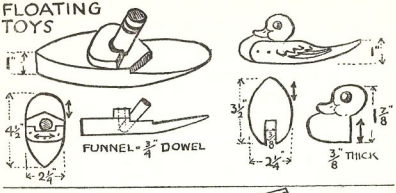


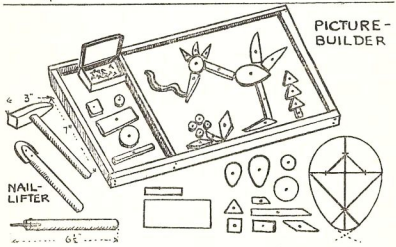
PRECISION TOYS
Pages 39–55

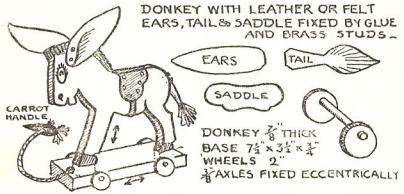


NOAH'S ARK
Page 75

LARGE AND SOFT TOYS
Pages 65, 83, 113, 117, 119, 121, 123







could be used, ducks which rock when on land, or rabbits —Little Bo-Peep—or the Thee Blind Mice—elephants or tits, all made to come out of their slotted trolley to be played with, or to be fitted in and taken for a ride. It is best to use hard wood for the animals and for the strips which hold them in place.

Cotton reel wheels are suitable and if your base is only two inches or less wide it is best to stagger the wheels so that sufficiently long screws may be used.

TROTTING DUCK

It will save a lot of trouble in cleaning up edges to fit, if the three parts of the duck are sawn out together. The necessary shapes are then cut from the centre piece before it and the handle are glued and nailed to the outer coverings.

The duck can also be made in 1″ wood, the foot slot being made by two saw cuts and the centre piece chiselled out gradually. When made thus, the stick, rounded at one end, should fit into a $\frac{1}{2}$″ hole bored at least 2″ deep, just above the wings and can be removable if desired.

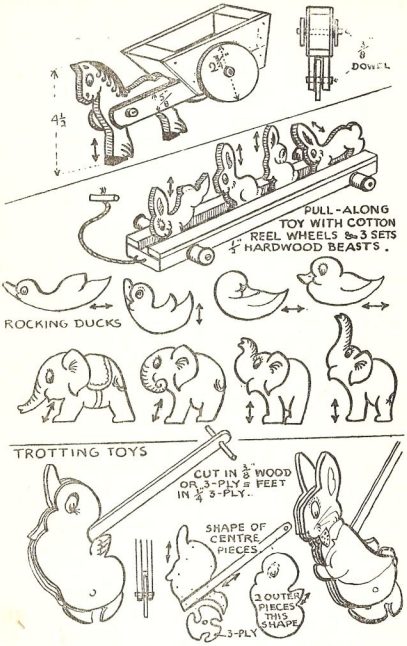
The leg wheel must be made of three-ply at least $\frac{1}{4}$″ thick and it must be truly circular. Space between the feet must not be more than $\frac{1}{2}$″ or the duck will refuse to trot.

The cross-piece in the handle makes it much easier for a toddler to use and even to get some slight support when learning to walk.

WIGGLEGATOR

This beast can be any length or streamline shape you like, so long as there are wheels every other section. Cotton-reels on $\frac{5}{16}$″ dowel (with washers), make satisfactory wheels.

Saw out the whole animal and bore holes for joints and wheels before cutting into parts. Make sure the wheel holes are in a straight line or the creature will run hysterically. Saw out the joints with a very coarse fretsaw, or better, with a bow-saw, and make the joints at least



$\frac{3}{4}$" long for strength. File the hole in the middle of each joint to run freely on a dowel which is glued to the two outer sections. Push in an odd piece of dowel and test whether the joints swing easily; file off any corners which prevent this.

MECHANICAL TOYS

It is good in a nursery to have a few toys showing some of the elementary laws of mechanics—rolling—rocking—spinning, etc.

SCALES

Three types are shown. The 5" scales do not weigh properly but will be interesting for small children. Nail two tin lids to the crossbar and pour in a little melted lead till weight is true.

The 10" weigh better and are more interesting to use. Weights could be made from different sized dowels, or small bags of sand or stones $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ ounces, etc.

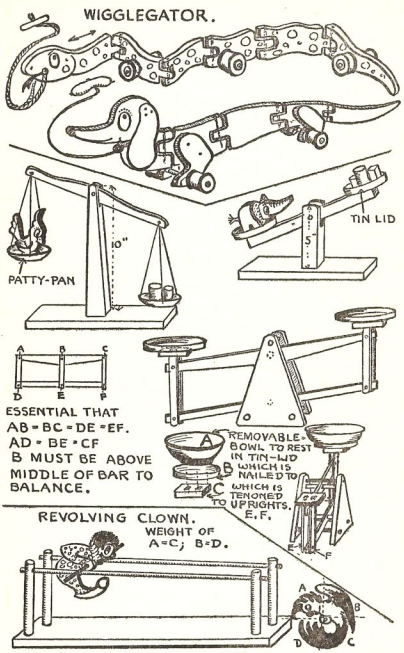
The third scales weigh really accurately, may be any size to suit available timber or could be made in metal. Do not make them less than 7" long for nursery use. All dowels must run easily in their holes. Adjust balance after making, by nailing or glueing little pieces of wood under the fixed pan on the lighter side. The scales must be accurately made.

REVOLVING MAN

This figure rolls down his sloping stand. He may be any shape (a revolving clown, monkey or macaw all look well). The axle must pass through the centre of gravity which is found by balancing a cardboard pattern of your proposed figure on a pin, and adjusting it before cutting in wood.

To be sure the axle passes through the hand of your figure draw it out first as in the diagram; each section should balance its opposite one. Thin down any part which is too heavy. The figure should be cut in $\frac{1}{4}$" or thicker three-ply; don't make it too flimsy.

A steel knitting needle makes a good axle.



WALKING HORSE

This beast will walk down a slope. Enlarge the squares of the pattern and copy joints exactly. Note the slope of the feet front and back and the amount of movement allowable for the legs. These must move very easily so rub a candle on all moving parts.

File the feet so that none of them drag, and if the horse rocks too much file inside of feet or shorten legs if necessary. If it rocks too little, file off outside of feet. Relation of height and width is important.

ROCKING ZEBRA

This may be on a solid base, or for larger toys, built up as shown. Anything narrower than about $\frac{3}{7}$ of the height would be liable to tip over when rocked fast.

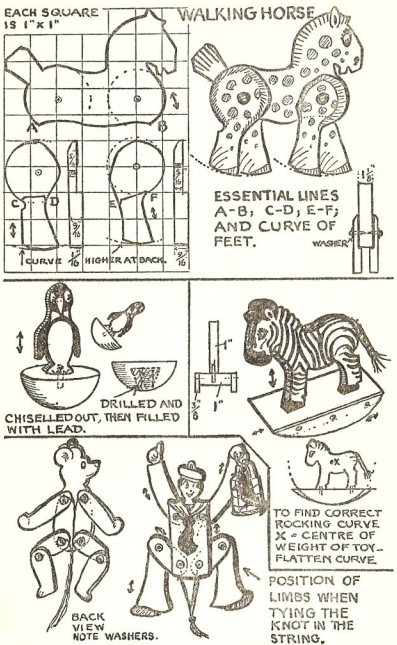
The best curve for rocking is found by deciding roughly where the centre of weight lies and drawing the rocking curve with that as centre. Flatten this slightly. If the toy tips up easily, flatten the curve, if it rocks too slowly curve it more.

WOBBLING TOY

The figure is made of thin three-ply or $\frac{3}{16}$" very light wood. A wooden button or the knob off a piece of old furniture makes a good base; bore a hole in this and shape the hole inwards with a small chisel. Lead is hammered firmly into this hole a piece at a time, ramming it into place with a nail head, or may be melted and run in.

DANCING SAILOR, OR BEAR

Either of these might pacify a crying baby, or could hang on the wall to be pulled and made to dance as a momentary attraction. They should be cut in 3-ply or in $\frac{3}{8}$" wood; if the latter, screw the limbs in from the back; if 3-ply then a panel-pin with a head may be used in the manner illustrated. When twisting the end of the pin, wedge a small tool between the body and limb being fixed, to ensure a perfectly free action. It is important to use washers in all positions indicated or you



will find the nails or screws will soon eat their way into the wood. The positions of the holes for stringing the limbs should be noted, and when finally knotting all the strings together pull the arms and legs as far up as you want them to reach, and knot the four strings together with them in that position. This is important.

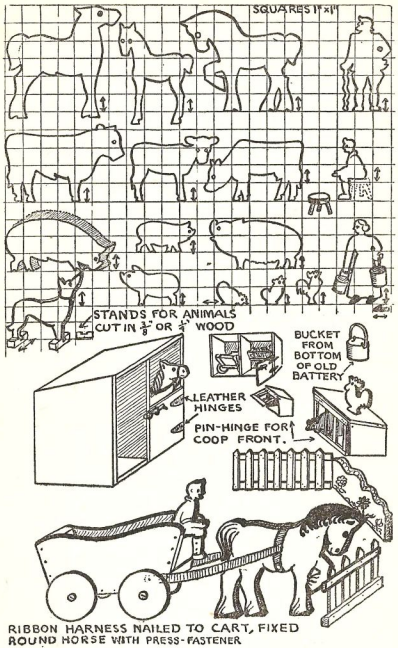
FARM AND ZOO ANIMALS

These are badly needed in the nurseries now that lead figures are unprocurable. Any good animal and figure shapes may be adapted for farm and zoo sets. It is most important to cut the figures with the grain of the wood running down the weakest parts, that is down, not across legs or beaks (see page 9). Figures $\frac{1}{2}$" thick will stand quite satisfactorily; one inch, better still; but ply-wood or $\frac{3}{8}$" wood, if more than 2" high will need some sort of support. The feet of the farmer's wife and the dog show suggestions for unobtrusive stands, but it is much better to design your creatures to stand without any added pieces as these are usually the first to get broken. If your animals can not be thrown about the floor without feet or ears or beaks chipping off, they will not be strong enough for the nursery.

All sorts of farm buildings can be made, stables, barns, pig-sties. File or rasp marks on a roof will give the impression of thatch, but sandpaper the splintery pieces off before painting, it is better to avoid this type of realism if you can't manage it without splinters! If you coat the sides of your building with glue and then sprinkle on sawdust, you will get a tolerable impression of a rough cast wall. Sawdust is better to use than sand as it sticks rather more satisfactorily and can be stained.

Figures may be painted, or stained and polished, or outlined in colours and polished. This is an effective and very speedy method, but your wood must be free from blemishes.

Hard wood is best to use. Be really simple in the treatment of your figures which should rely on a good



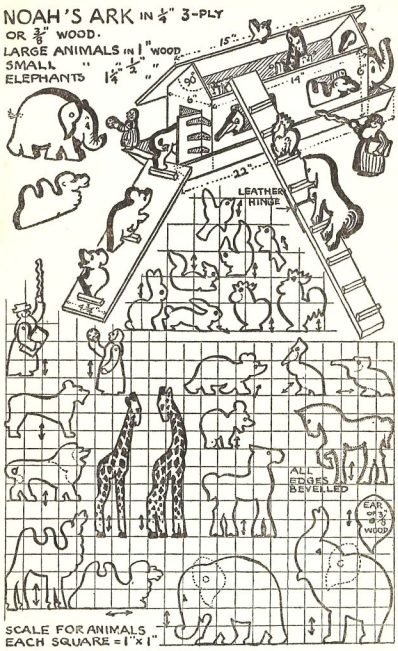
shape for recognition, rather than a realistic manner of painting.

NOAH'S ARK

Your Noah's ark must be very strong and the lid easy for a nursery child to manage; one side of the roof should be removable so that it may be used as a gang-plank. A door is a good thing but not necessary; if one is not made, a 24″ ladder should also be provided, as the roof-plank would of necessity be too short to allow the animals to process in by the roof. The ladder should be 2″ wide, about ⅜″ thick and have ¼″ rungs across it at intervals of about 1¾″. If these are put too close together the animals will not be able to get their feet between the rungs and will slip. A leather hinge enables the ladder to fold to go inside the ark.

Windows are more essential than doors, and these should be at a height in the sides so that most of the creatures can look out, but not so large or near the bottom of the ark that the beasts constantly fall out. The easiest method of window making is to drill a ½″ hole at each window corner and cut the sides with a fret-saw or key-hole saw. Mrs. Noah is the sort of woman who would put up chintz curtains and they add to the ark's gaiety.

Paint is not good for ark beasts as they get jolted about together too much. It is possible to make a set using either different coloured hard woods, or ash or beech stained. Use only one colour per animal, except for occasional penguins or pelicans who need a colour variation, in beaks and feet. A line should be scored with a marking knife where one colour is to end, this prevents it running into the next colour. All other details may be done as suggested, with a chisel. A triangular nick for an eye may be made or a hole drilled ⅛″ deep after staining. Giraffes can be spotted by means of a large nail, filed diamond shape, heated and the spots burnt on. Sometimes an exception is made to the non-painting rule in the case of Mr. and Mrs. Noah, who like to be gay.



TRAFFIC LIGHTS

Ideally, nursery children should not be allowed unaccompanied among traffic, but the fact remains they often are, and the sooner they learn traffic signs the better. If playing with toy traffic signals can help them to grasp the rules of the road, it is hoped they will carry the game on in the streets and so lower the appallingly high death rate of over 100 children per month killed on the roads.

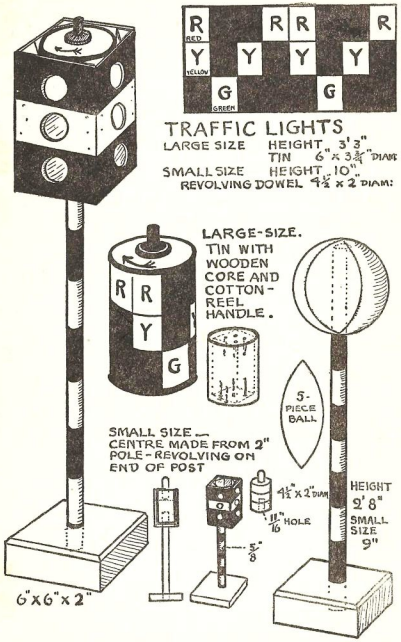
The traffic signals are simple to make and to use. They may be either 10″ high for use with toy cars, or 3′ high for the children themselves to use. By turning the knob the "lights" are regulated as in reality.

For the smaller size, a solid rod $4\frac{1}{2}$″ high × 2″ diameter can be used for the centre control, for the larger size a tin 6″ × $3\frac{3}{4}$″ diameter is necessary. The diagram shows the fittings and colours. The size of the patches of colour will, of course, vary according to the size of the tin, but each patch should be $\frac{1}{4}$″ wider than the diameter of the holes in the outside case. The knob for regulating the lights is made from a cottonreel with a thin waist, with one end whittled away and the hole plugged with a $\frac{5}{16}$″ dowel. This knob being constantly used should be painted black.

The frame should be made of 3-ply, $\frac{3}{16}$″ or less thick, strengthened at the corners and fitted on to a solid base of 1″ wood. A thicker ply would cast too much shadow and make the lights difficult to see. Leave no more than $\frac{1}{8}$″ play for the tin and choose one with a rim at the top and bottom, as this will take all the friction and prevent the paint from getting rubbed away.

The Belisha top is made from firm yellow cloth or felt cut in five or six pieces. The pole should reach nearly to the top of the ball, which is nailed and glued to the pole in the position shown, after four and a half sides have been sewn up. Stuff with small pieces of rag or newspaper or wood shavings, tightly packed to make a firm ball.

Paint the finished work (except of course the yellow



ball) with undercoating and one or two coats of glossy paint or enamel.

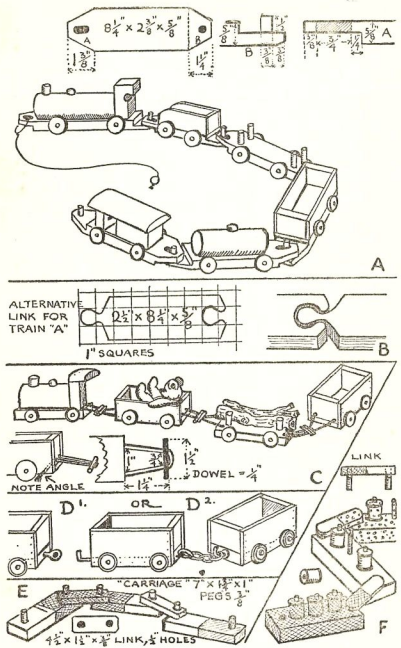
TRAIN

A train should always have four or five parts, but with six, model (A) with its very flexible coupling has the added advantage of being able to hook up on its own tail and go round in circles! These couplings have been very carefully thought and tried out and every measurement is important. Hard wood MUST be used for the dowels and bases, and it is important that the linking slot be $\frac{1}{16}$" larger than the dowel which is to link into it, and which must fit easily and not jam in any position or come unhooked when the train is towed at speed. Screw holes must be bored very accurately and the wheels run easily. (See page 21 *re* wheels.)

(B) This alternative coupling for the same train may be slightly quicker to make but is not nearly so flexible in use as (A). Bases must be made accurately in hard wood, and must all be interchangeable. If you are skilful with a fret-saw, you can cut the coupling while interlocked; or you may bore holes, chisel and saw and file each part separately.

(C) This train should have at least three trucks 6" × $2\frac{3}{4}$" × 2" deep and an engine, and has plenty of loading capacity. The coupling is simpler, not so permanent, but very much more easily repaired than (A) or (B). Trucks will fit either way round. Keep to the measurements in the diagram, boring the holes as long as possible for strength and it is essential to have the cord of the links $1\frac{1}{4}$" long. $\frac{1}{4}$" wood, rounded on all edges may be used for the link if dowel is not easy to come by. It should be $1\frac{1}{8}$" long.

(D) A fourth link is made with cup-hooks and chain-links or screw-eyes, although these are slightly harder for the younger nursery children to manage than (A) or (B). Make sure the screw-eyes have long shanks and are strong and put in correctly, so that the trucks do not ride with some wheels off the ground.



(E) PRIMITIVE TRAIN

A primitive type of linked train for the two-year-olds can be made from wood 7″ × 1¾″ × 1″ and linked by pieces 4½″ × 1½″ × ⅜″. Added point can be given if the "carriages" are coloured half one colour, half another, so that the appropriate links can be matched up. The proportionate lengths of links and holes are important, as this is for the very young to use as one of their very first fitting toys, and must fit very easily. Hard wood should be used for the links and preferably for the whole toy.

(F) Another variation on the same theme is also shown ; in this case the carriages are each a separate colour on which their appropriate coloured cotton-reels may ride, and the links this time are two colours.

To stain the pieces, score all round deeply with a marking knife, where the colours join, so that the stain will not run into the wrong half. If paint is used, do not paint the bottoms of the train, or your floor will suffer from paint smears.

BRIDGE

This may be any size according to available wood. The one shown was made to take a train 4″ wide. It must be strong enough for children to walk over ; it is usually the first thing they do with any bridge large enough to take their feet.

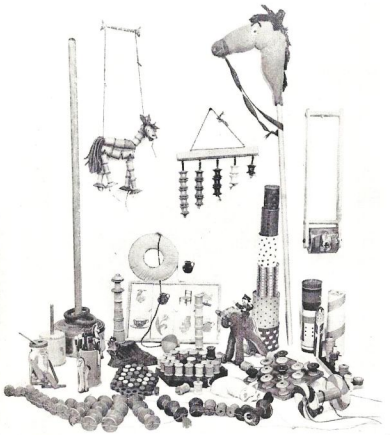
By turning the supports over, different slopes can be made, and with enough parts viaducts, switchbacks and roads right up on to tables can be built, the train running smoothly over the bridge joints.

Note particularly the shape of the supports and the parts which fit them ; they must be accurately followed to ensure smooth working.

Make a signal and station to go with your bridge and trains.

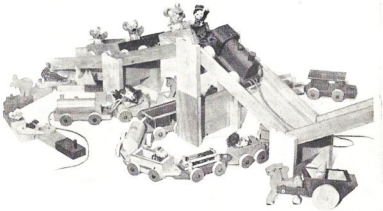
TRUCKS

(1) A truck may be any size you like but no part should be less than ½″ thickness. Wheels, axles and

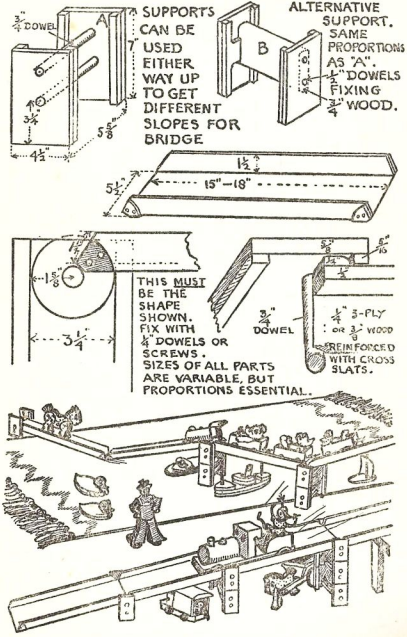


IMPROVISED TOYS
Pages 87 to 105, and 113, 117

LARGE AND SOFT TOYS
Pages 55, 67, 77, 111, 113, 115, 123



BRIDGE AND TRAINS
Pages 67, 79, 81



brackets for axles MUST be made from hardwood. For different wheel possibilities see pages 23, 25. The diagram of truck shown has proved a very practical method for small trucks.

First glue and nail the sides to the base, then square up the end pieces, so they fit exactly between the sides. Glue and nail them from the bottom and sides.

Stain or paint your truck before fixing the wheels. If stain is used, it is possible to have the sides coloured and the bottom plain wood, which looks very effective. Fix the wheels after the colouring has been done.

Wooden brackets for the axles could also be used, but the amount of time and screws taken is hardly worth the small saving in timber involved.

This type of truck is doubly useful if filled with bricks and a towing hook at the back is also handy.

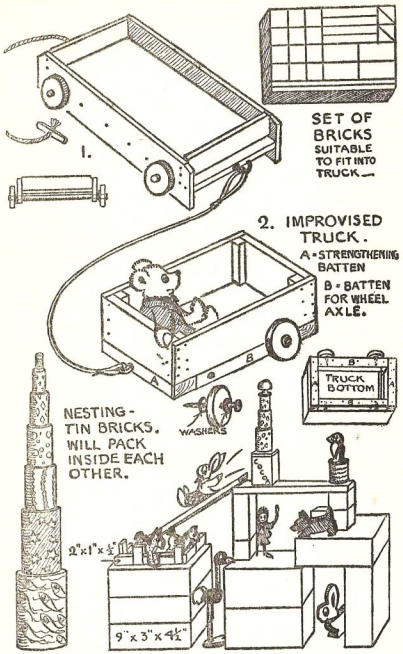
(2) Another type of truck of a more improvised nature is shown. Made from a strong wooden box, it will serve as a very good substitute for a doll's perambulator, but it must be strong enough for a child to sit in, possibly two children! If the only box available is at all weak, strengthening pieces should be put down all the corners. (See also pages 124, 125.)

Sandpaper and paint brightly, before putting on the wheels. All bedding should be removable for washing.

BRICKS

A cross-cut mitre-box is essential and a machine-saw very desirable when making bricks. When planing them, constant use of the try-square is necessary, as they MUST be rectangular for building. A leaning brick is a most depressing pest when house-building.

Round off all sharp corners, for bricks are apt to get thrown about and sharp edges might cause damage; for the same reason it is very much better to stain and wax-polish them than to use paint. Do not put too much polish on or they will skid when knocked very slightly, and buildings collapse.



If you keep your bricks in a truck in a nursery, the following is a good proportion to use, and may be increased according to the size of the truck. Size is immaterial so long as your bricks are multiples of one another: 12 CUBES—4 DOUBLE CUBES—4 DIAGONALLY-HALVED CUBES—4 LONG BRICKS (3 CUBE LONG and ½-CUBE WIDE) plus 2 BRICKS about 1′ LONG and ½″ THICK.

With one or two sets as above, some large bricks and improvised bricks, your nursery should be well stocked, though you cannot ever really have too many, as they are of such great importance in any sort of constructive and imaginative play.

A very useful set of small building bricks could be made very quickly indeed. 50 red, 50 yellow, 2″ × 1″ × ½″, or alternatively commercial brick proportions, 3″ × 1½″ × 1.″

Make some sets of large bricks, hollow ones (9″ × 4½″ × 3″ is a good proportion), or cigar-boxes make good bricks if strengthened by a cross-piece of wood in the middle, the lid nailed on and the paper covering removed.

Tin bricks and nesting tin bricks are also good to use with the wooden and more orthodox bricks and finally, valuable additions may be made by salvaging pieces of broken-up furniture, curved pieces for arches, 2-foot long planks for long bridges, drawer knobs for domes, there is practically no end to what may be found useful.

SEE PAGE 29

CHAPTER 6

WASTE MATERIAL TOYS

WASTE MATERIAL TOYS

It is important nowadays to make full use of scrap materials before they reach their final destination as salvage. This chapter gives some suggestions.

TINS

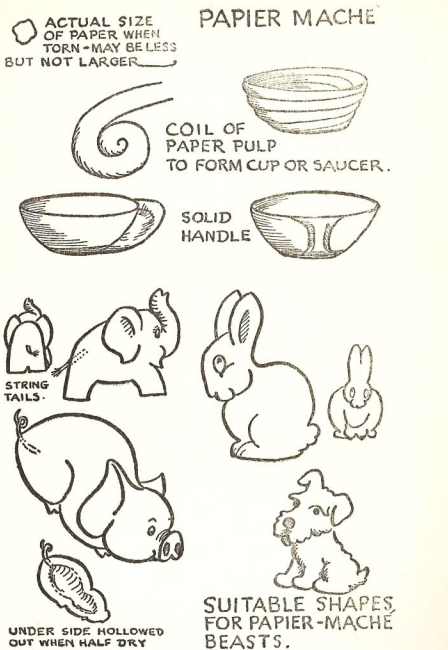
Many modern tins are flimsy, with sharp edges, dangerous to a child. It is quite easy, with the aid of pliers, to bend IN the rim about $\frac{1}{8}$" all round, doing this carefully about $\frac{1}{2}$" at a time and beating it flat with the wedge-end of a hammer. A strong double rim is thus formed, minimising the risk of cuts. Remove any roughness with emery cloth or glasspaper or file.

If you have no metal drills and wish to bore small holes, either hold your tin on a broom handle or strip of wood and hammer through the point of a nail of a suitable size, or else hit the nail into a length of wood, put this inside the tin which is then hit on the outside with a piece of wood or a wooden mallet, forcing the nail through. In either case it is absolutely essential to file the rough edge so caused, perfectly smooth. Never leave a jagged edge on a tin. It would be better to do without the toy altogether than to risk cuts from possibly rusty tins. (See page 89.)

If a half inch hole is needed to take a dowel, this can be done by making several holes very close together, always hitting through on to a piece of wood, to prevent your tin from cockling under the strain. Your dowel can be forced through quite easily.

ROLLING TOY

A strong tin of the old golden syrup variety is needed. A length of wood, at least $1\frac{1}{4}$" × $1\frac{1}{4}$" must be put inside the tin and nailed firmly to the bottom. Put a few pebbles in, to make a rattle, before nailing on the lid.



SEE PAGE 106

The handle shafts are screwed on by 2½" No. 12 screws. Don't forget to use washers; and paint your roller in bright colours.

ROLLER

This is a simpler type to make, though not quite so strong. Make ⅜" holes in the centres of the tin ends to take a 5/16" dowel. Put washers both ends and glue on two of the "waisted" type of cotton-reel. Attach ribbon or cord.

TIN AND PEG-MEN

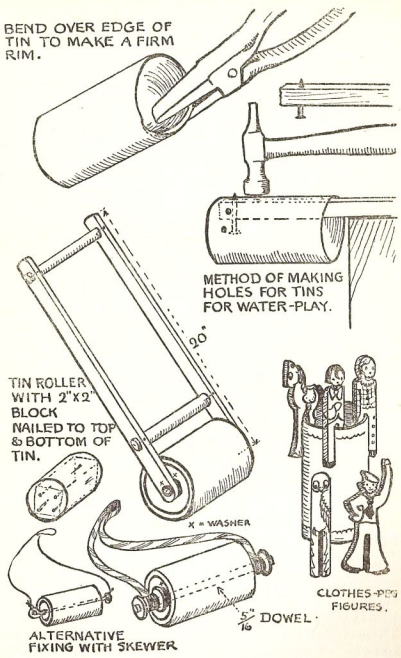
In one nursery the under-two's played with the peg-men and their tin more than with any other toy.

File or cut the feet of the pegs flat so they will stand, sandpaper thoroughly, and paint the little men as gaily as possible. If you have a fret-saw (or you could use a penknife) you can make some such variations as those suggested. Paint the tin also. The pegs can be perched easily round the edge or popped into the tin with a pleasing plop. A 4" tin makes a pleasanter plop than a 3⅛". The cheapest and lightest type of peg will bounce right out of the tin.

TIN FOR WATER PLAY

A very simple type of watering-can is made by boring a few holes in a tin. The variations possible are of course endless, but the following make a good selection: (1) Tin with two 3/16" holes, ½" apart and 1" from the bottom of the tin. (2) 1/16" holes all round the tin 1" from the bottom. (3) ¼" hole 1" from the top of the tin. Give two or three coats of paint to prevent any chance of rusting.

If you add tough little bottles with necks (these gurgle better than straight sided bottles), funnels, short lengths of rubber tube one foot long, a fish and a frog or two cut from old rubber tyres, and any floating toys, you will have all that is necessary for water play which is a psychological essential of the nursery programme.



TIN RATTLE

Good rattles for the babes in cots can be made from any round tin, with a $\frac{3}{4}$″ dowel for a handle. Make a hole in the lid and a smaller hole to take a screw in the bottom. The dowel goes right through the centre of the tin. You can use small pebbles or bits of tin or wood to make your rattle. Pad the tin well before covering it with a suckable material. If you can get hold of old books of sample oil-cloth these make ideal covering material. You may find it best to punch holes in the oil cloth before sewing, to minimise the danger of splitting the material. Either leave the handle plain wood or paint with three coats of paint which must have a glossy finish as it is sure to get sucked.

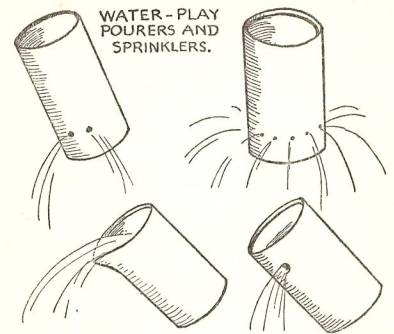
SKITTLES

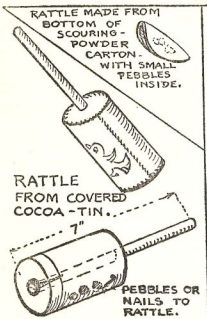
Scouring powder containers, if brightly painted, make good skittles, although a tall tin at least 6″ high is better. A tin can be more elaborately painted, but it is a mistake to put more than the slightest decoration on the scouring powder cartons which are made of card and bound to have only a short life.

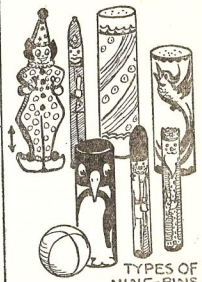
A more permanent skittle can be made from a broom-stick. A cross-cut mitre-box is almost essential for cutting the stick so that it will stand dead square. You can also make skittles of 1″ × $1\frac{1}{2}$″ wood cut and filed to shape. Paint them as little men, clowns, penguins, or policemen. A really firm cloth or leather ball, stuffed hard, goes with the skittles (see page 116 *re* balls.)

POSTING BOTTLE

A variation of the posting game can be played, if you can procure a strong glass bottle with a screw-top. Different shapes of variously coloured cardboard or very thin ply are posted through holes in the screw-cap. These are either sawn with a metal-cutting blade in a fret-saw or the metal being thin, can be cut through with a chisel or a penknife; which will need sharpening







after the operation, but will otherwise come to no harm. The rough edges must be filed smooth. The screw-top can be painted on the outside and will probably be used for screwing and unscrewing quite as much as for its posting purposes; shells or coloured buttons or cotton-reels may also be posted.

BEADS

These can be made in many varieties and are useful for sorting shapes, sizes, colours as well as for threading. They should not be too thick to thread on to the modern rather short-tagged bootlace. Drill the holes ($\frac{1}{8}$") before the bead is cut out; this minimises the risk of splitting. Hard, close grained wood is best.

Glass-paper the beads thoroughly, so that they are pleasant to touch and to wear and get a bright and interesting colour scheme in each set, including a few black ones.

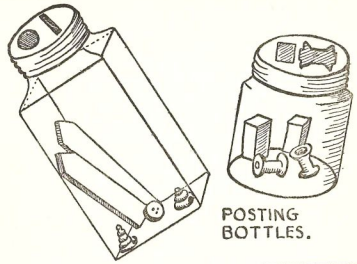
Some of the suggested shapes can be made from various types of cotton-reels. Interesting effects can be got by chiselling out a few nicks from the shaped ends of the "waisted" type of reel.

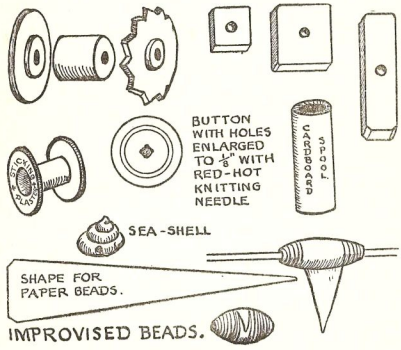
Dried marrow seeds, corks, acorns, milk bottle cardboard tops (5 or 6 glued together), sticking plaster spools, the stronger type of sea-shells, paper beads can all be used. Shells are brittle, but holes can be bored quite easily using a hand drill very carefully.

Paper beads should be cut more or less to the shape shown; the longer the paper, the fatter the bead. The rounded top edge is important. Paste or glue the paper thoroughly, and roll it round a No. 8 or larger knitting needle, removing it just before the paste sets hard. Make the beads of coloured paper or paint when finished, and don't make the beads too long to thread easily.

MATCH-BOXES

These, being by nature flimsy, have a comparatively short life, but may be used for small bricks and doll's house furniture.





(a) BRICKS

Fill the match-box with sand, bind round very firmly lengthways with tape or strong paper, well glued, then cover with paper. The pattern shown gives the minimum of overlapping necessary, ridges must be avoided or you will find the bricks tipsy to play with.

Match-box bricks, filled only with paper and covered as above, have also been used in some nurseries to give to children as noiseless playthings to be used by those who wake up early in the rest hour.

(b) DOLL'S HOUSE FURNITURE

Fill four match-boxes with sand, cover each one with cloth, then sew them firmly together to make a doll's house armchair. An added piece covering the whole back and bottom of the chair strengthens it considerably.

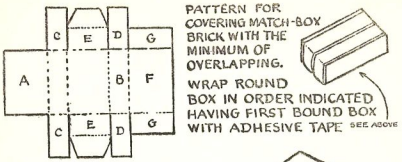
Chests-of-drawers are flimsy for nursery use, but easy to replace. Use a really strong piece of paper to cover the lids of the boxes, which should be well glued together. Paper fasteners form handles to the drawers.

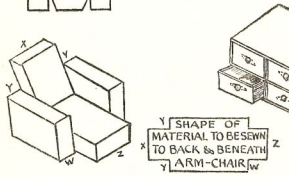
COTTON REEL TOYS

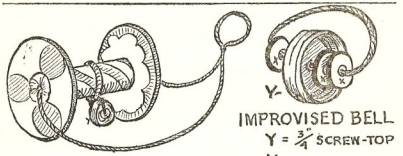
The W.V.S. and other organisations in most areas organise the collection of cotton spools for salvage, but will collect also for nursery use. It is surprising the size and variety of reel obtainable.

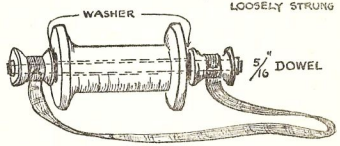
MUSICAL ROLLER

This is made from one of the $4\frac{3}{4}$" wooden spools on which cord or wire flex is wound. It should be thoroughly glass-papered and the ends painted so that a third colour appears as the spool revolves. A strong cord through the central hole is all that is needed for pulling by. The music is supplied by a bell if you can buy one, but a very good bell-like substitute may be made by boring and smoothing a hole in a screw-top lid of about $\frac{3}{4}$" diameter, and threading loosely two bright steel washers on the inside and one washer on the outside. Fix this to the roller so that the bell just touches the ground when the reel revolves.









COTTON REEL ROLLER

This is made from two small "waisted reels" and one 3" reel which has a larger hole than the normal reel, allowing it to revolve freely on a $\frac{5}{16}$" dowel which is glued to the two side reels. A washer should be put on either side of the big reel. Ribbon or cord is tied or sewn to the waists of the two small reels.

COTTON-REEL DRAGON

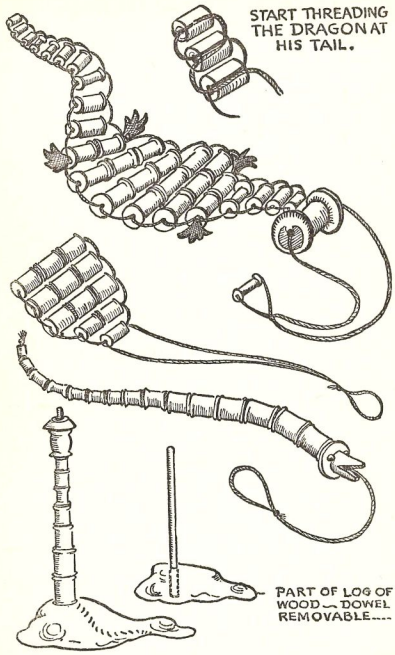
Thirty assorted reels are needed to make this dragon who is popular with the two- and three-year-olds. Colour the head and tail reels red and the body green and blue, and thread them on a coloured string or cord. It is easy to dip the ordinary white string in stain. This will need stretching and crumpling a little to soften it after the stain has stiffened it. Starting at the tail, thread your string through both sides of the reel as shown, do not pull too tightly or the reels will not roll easily. The feet can be made of pieces of coloured leather sewn to the string, or threaded on *en route*. The handle should be at least two feet long, so that the dragon glides with his head on the floor.

With fewer reels, a rolling toy, three reels wide and four long can be made, but a dragon with a swishable tail is much more entertaining.

COTTON-REEL SNAKE

If you have a fair selection of reels you can make a carefully graded snake which may be threaded and unthreaded by the children. It may not be necessary to colour him, as you can get reels in orange, black, purple, yellow and brown. Knot the cord at the tail end and splice the handle end and bind firmly to make a good threader, not too thick to pass easily through the reels.

There is no need to knot the cord at the head end, the large head reel when the snake is dragged along the floor helps to keep the other reels pushed towards the tail



LIGHTHOUSE

This is best done with holes in the reels enlarged to $\frac{9}{16}$" so they will slip easily over a $\frac{1}{2}$" rod. Painted and put on a base cut from a log with scrubbed bark still on, it will look as though the lighthouse were really perched on a rock. Cut steps up to the lighthouse door.

COTTON-REEL MAN

He will make an amusing addition to the doll department. He should be painted brightly and arms and legs made to unthread as shown.

COTTON-REEL HORSE

The body reels are fixed and neck and legs made to unthread. His legs should be tightly threaded so that he can stand, however coltishly. Note the reels cut on the skew.

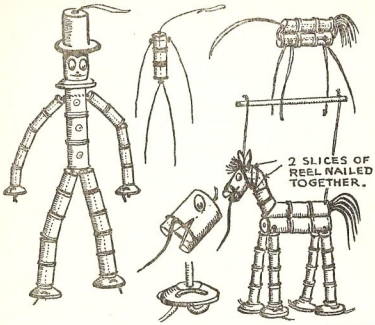
COTTON-REEL SORTER (A)

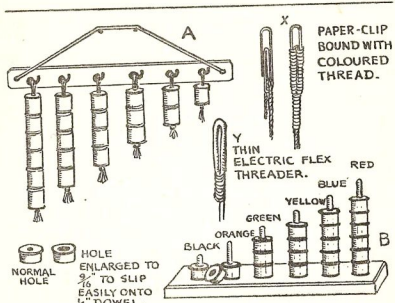
This is an excellent use for reels. To get a firm tag for threading the reels, use a large size paper fastener, hammer this gently so that it will pass through the reels and bind with coloured thread or string on to a bright shoelace, cord, or thin electric flex. It is important to have all the threads and cards the same colour or the child may get confused as to what he is supposed to be sorting.

If cup-hooks are unobtainable use small headed nails hit in at an angle. They must be strong enough to stand six reels hanging from them and should have not more than one-third of their length protruding. Paint your reels in easily distinguishable colours.

COTTON-REEL COLOUR SORTER (B)

The normal $\frac{5}{16}$" hole of a cotton-reel must be enlarged to $\frac{9}{16}$", as a $\frac{1}{4}$" upright would never stand up to nursery use. The reel, protected by a duster to prevent bruising, should be held in a wooden vice and drilled with a FORSTNER bit or an engineer's drill. If a centre bit is used, the hole must first be plugged or the bit cannot grip. (See also page 18.)





Reels may be accurately halved by using a mitre-box with a stop adjusted to half cotton-reel length from the saw-guide; or less accurately sawn when gripped in a vice.

Be careful in colouring not to get the blues and greens or reds and oranges too near in tone so that they might get muddled with one another.

COTTON-REEL MOSAICS

This is another type of cotton-reel mosaic, more useful for satisfying the desire to fit pegs and holes together than for any extensive pattern making.

Saw the ends from 13 of the waisted type of cotton-reel, mark out a board carefully and nail and glue these ends as shown. Glue into the reel holes pieces of dowel with an inch protruding.

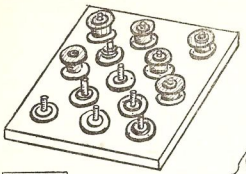
Enlarge the holes slightly in the remaining parts of the reels so that they fit loosely on to the pegs. This can be done by twisting a riffler or a rat-tail file, or the square shank of an ordinary file a few times in the holes, this will enlarge them quickly and easily. (See page 18.)

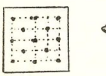
Paint the board and bottom reels all one colour, and the parts to be fitted, five one colour and eight another. If you colour the bottoms to match the tops, it becomes a colour-matching rather than a pattern making play.

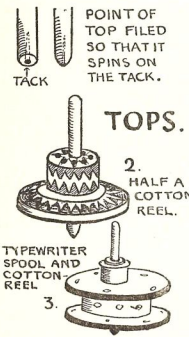
CORK MOSAIC

The simplest type of utility mosaic can be made from one of the felt tea-pot stands available in some shops. It is made of felt with half-inch holes all over, into which a normal medicine-bottle cork fits easily. All you have to do is to paint the tops of the corks red, yellow, and blue, as the felt stands are already coloured. To make an interesting shape and to save collecting quite so many corks, cut your base hexagonal.

The children will enjoy poking out the corks from the back, quite as much as placing them in patterns on the front of the board.







TOPS

Coloured tops are always an attraction to children, but as four-year-olds have not usually the strength of thumb required to spin tops easily, they are one of the last things to add to nursery equipment.

Absolute accuracy in centralising of holes and filing points is essential. Tops spin best if the weight is near the rim rather than in the centre.

No. (1) is the most satisfactory type, made from a 3-ply disc, $2\frac{1}{2}''$ diameter through which a $\frac{5}{16}''$ dowel, $2''$ long is pushed. The weight should be well down so only $\frac{3}{8}''$ should protrude below the disc.

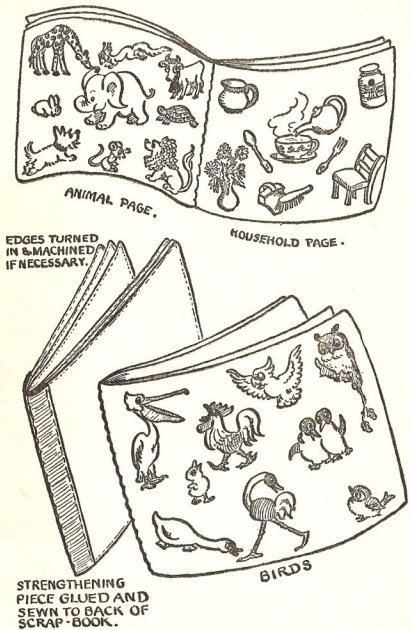
To prolong your top's life, before filing the spinning point, knock a $\frac{3}{4}''$ panel pin into the centre of the dowel; then file the point, so that the top spins on the pin-head not the wood.

No. (3) An old type-writer ribbon spool with part of a cotton-reel above makes a good steady top. No. (4) A large-sized plywood top to be spun by the children with both hands is also suggested. Make the handle long enough for the hands to grip.

Use primary colours so arranged that secondary colours appear when spun. As blues are rarely pure it is easier to get purples and oranges than green. Do not use many colours or a most disappointing grey will appear when a previously bright top is spun.

SCRAP-BOOK

A good, hard wearing nursery scrap book can be made from coloured black-out cloth or book-binder's canvas; having a slightly glossy surface it is better to glue the pictures rather than paste them. Machine a fine hem all round the edges of the pages and strengthen the fold by glueing and machining on an extra piece. Your book must open really easily and the pages fold back quite flat. Curtain rings can be used to join the pages; the modern ring, not being soldered in a complete circle, can be forced open and through holes punched in the fold of the book.



The following takes some little time to collect, but is much the most interesting and worth-while type of scrap book: Make pages as follows—with anything up to fifteen pictures per page.

BIRDS such as robin, owl, turkey.

ANIMALS such as elephant, cat, giraffe.

KITCHEN fittings and utensils, saucepan, kettle, broom.

SITTING-ROOM—Fireplace, wireless, tongs, arm chair.

BEDROOM—Bed, chest-of-drawers, eiderdown.

TEA TABLE—spoon, fork, jam, bread, cup.

CLOTHES—Hat, boot, coat, Wellington's, gloves.

PEOPLE—Postman, butcher, policeman, sailor, Lord Mayor.

This will be infinitely more worth while to do than the usual book with pretty ladies in crinolines and a robin or two, from Christmas cards. It can be a valuable aid to learning new words.

Use as many coloured pictures as you can, or if this is not easy you can add a coloured border of plain paper. Take care to cut carefully round the pictures, so that if you want a picture of a shoe, don't include the socks or legs. THEY SHOULD BE ONE-WORD PICTURES.

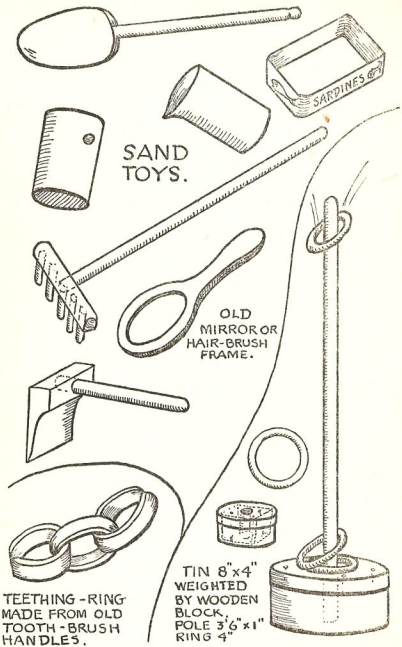
SAND TOYS

Simple improvised sand toys are as effective as any, these may be made from two or three strong tins, painted inside and out, or at least varnished on the inside to prevent rust, also patty pans of various shapes and sizes, a tin or Bakelite beaker for sand pies; a tin with a half inch hole in it for pouring dry sand, a large wooden spoon and a rake and hoe which may be made as suggested, quite easily, taking care to round off the prongs of the rake well, or they might prove a dangerous weapon for any small feet that got in their way.

The hoe may be shaped with a gouge or a chisel and file.

TEETHING RING

Take three or four old tooth brushes, being careful not to use the celluloid variety. Saw off the brush and file



and sandpaper quite smooth. Place in boiling water and after three or four minutes, the brush handle will be quite pliable. Hold in a thick cloth and quickly bend round in a circle while still hot. If one immersion is not sufficient to enable the ring to be bent round as required, re-heat, but note that the handle will straighten out again in the water if not prevented. Three or four coloured links can be made in this way, safely suckable and attractive to look at.

RINGED POLE

This is a good game for two and three-year-olds, who have to stretch up to put the rings on to the pole. The essentials for the game are a broomstick 3′ 6″ long and five or six wooden curtain rings. A bucket-full of sand or soil will do to fix the pole into, but it is more satisfactory to make a permanent base from a 9″ tin into which a solid block of hard wood is fixed. A hole for the broom handle is bored into this and the pole glued in. The whole thing is tipped up for the rings to be removed, which is vastly more entertaining than taking the pole from a bucket of sand and just picking up the rings so released.

The usual varnish can be removed from the rings with sugar-soap, or soda; they must be well sandpapered before the rings are re-stained bright colours. Colour the pole also.

PAPIER MÂCHÉ (See page 87)

Tear clean, crumpled, old newspaper into ½″ pieces. It is important to tear and not cut and very important to get the pieces really small. Pour on hot water and soak for at least 24 hours, stirring and beating occasionally with a wooden spoon. When the paper is pulped and no longer in separate pieces, squeeze out as much water as possible.

Fill ½ of a small pudding basin with cold-water paste or plain flour (not self-raising), add a tablespoonful of alum to increase stickiness, and a teaspoonful of salt.

Stir, then add cold water until you have a Devonshire-cream-like mixture. Leave for a while, overnight if possible, then add boiling water gradually, stirring very vigorously, to avoid any lumps, until the mixture thickens to blancmange consistency. Add three or four drops of oil of cloves if you need the paste to keep any time.

When the paste is cold, mix it slowly into the paper pulp, kneading it with your hands until it clings together in a sticky lump-like dough and is easy to model, and not over sticky, free from lumps and a uniform pale grey colour.

Make a roll of paste of small finger thickness and build up cups and saucers as in coiled pottery, overlapping each coil carefully with the next and smoothing with your fingers as you build. It helps to keep a good shape if you work on a base made of a piece of paper the size you need for the bottom of the vessel. You will find the coiled method of construction is better for papier mâché than building from slabs of pulp joined together, which is another way of making pots. Set the articles to dry on a greased plate, and when firm but not hard, attach a piece of pulp as a handle to a cup or jug, building up with more pulp at the sides to make a firm joint.

When stiff but not quite dry, paste small pieces of white newspaper all over the cup or plate, overlapping each piece to form a smooth surface. Set to dry and watch occasionally to see the articles keep their shape. Don't dry in front of a fire or they will warp. It is better to curb your impatience and allow them to dry slowly and evenly. Paint and varnish them when quite hard.

An alternative method of modelling cups is to grease the inside of an egg-cup thoroughly, especially round the rim, pressing in the mixed pulp evenly. Smooth the inside well with your finger and leave to dry.

Animals and balls may be built up solidly from papier mâché, but as they take at least a fortnight to dry right through, it is best to hollow out the middles of animals

if possible, by means of a hairpin or modelling tool, when the creature is set leather hard on the outside. It is best to do any fine modelling the day after the figure is roughed out. Aim at simple clear outlines and shapes as in the wooden figures, and be careful to avoid fragile ears or limbs, that might easily break when dropped. Sandpaper them before painting or staining.

Small balls about $1\frac{1}{2}$" or 2" in diameter are excellent to make, although the latter may take a month to dry right through. Sandpaper or file to a good shape, and cover with strong cloth or leather. The result should be a good light weight ball that bounces.

CHAPTER 7

SOFT TOYS

FAR too many soft toys are being made which, although quite good as individual playthings in the home are not really suitable as community toys in a nursery of thirty to fifty small children.

Make mostly various sized dolls, baby dolls, and Teddy-bears, with easily removable clothes. You might also include a sturdy dog and elephant, strong enough to be sat upon—also gollywogs, monkeys and long-legged, dressable rabbits are good, but don't flood the nurseries with an army of white toys or ducks, squatting rabbits or penguins which can't comfortably be dressed or put to bed, seated at tea-parties or serve as steeds for other toys. Don't be afraid of gay colours for your toys, but remember that a nursery full of chintz animals can make an ordinary brown bear look very acceptable!

GENERAL PROCEDURE

Use strong scraps of material, allowing at least $\frac{1}{4}$" turnings. Preferably machine together, or sew with strong cotton, using a very small back-stitch. Remember to leave suitably large openings for stuffing. White sheeting is easily dyeable flesh colour for dolls.

Cut rag stuffing into $\frac{1}{8}$" pieces or use substitute Kapok, or cleaned Flock from old pillows or bedding. For standing toys, such as elephants, wood-shavings or wood fibre, if procurable, are good, but not for the smaller type of toy. Put in only a little stuffing at a time and poke well into arms and legs with the blunt end of a pencil; the sharp end will poke holes in your material. For cuddly toys don't pack too tightly, although they must be firmly and evenly stuffed. For washable dolls *RAG* stuffing *MUST* be used.

STIFFENING

Stiffen all necks with a roll of cardboard. A wobbly headed doll or Teddy-bear is depressing. Dogs' and

elephants' legs can be stiffened with rolled cardboard or a toilet roll centre or sticks with rounded ends so that they will not work through the material, but in all cases, pad the card well with stuffing so that it is not easy to detect the stiffening when finished.

FOUR-LEGGED BEASTS

Most current patterns are much too elegant in the leg for nursery use. Animals which stand should have really solid legs which MUST be strengthened with cardboard or cotton reels strung together. A circle of cardboard in the bottom of the feet helps stability in standing.

If a beast is more than 8″ high it will almost certainly get sat upon and must be strong enough to stand the strain.

Make front legs slightly longer than the back, which will counteract the top-heaviness of the head.

After stuffing, most four-legged animals need tucks taken underneath them where the four legs join the body. This brings the legs to a vertical position, when otherwise you will find they have a marked tendency to go splay-footed or even do the splits when pressure is put on their backs.

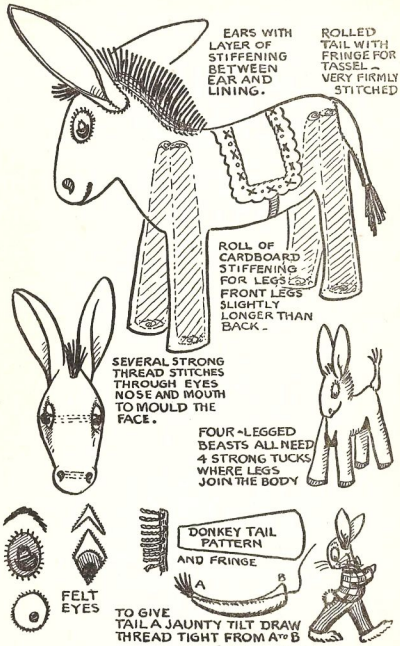
Sew these tucks very firmly, twice each, with a strong thread.

LIMBS

Sew on all limbs at least twice with very strong thread. Remember that arms and legs, tails and ears, get used as handles and should be attached as firmly as any other handle.

FACES

For nurseries where there are very small children who might pull out and swallow buttons, faces are best embroidered. If, however, you use buttons for animals' eyes, when you have sewn them firmly with double thread, stitch four or five times through the head from eye to eye, pulling each time as tightly as possible. This sinks in the eyes, thereby puffing out the cheeks and generally moulding the face and giving more character



and liveliness to your beast. This applies also to dolls' eyes, whose faces you will find can be modelled into characterful expressions by a few tight stitches at corners of mouths, and if a stretchable stocking material is used, you can insert a very small cardboard nose, padded with a scrap of cotton-wool, and stitched firmly into place. Pad cheeks also with cotton-wool. (See page 115.)

The eyes of the doll with a moulded face must be firmly stitched through to the back of the head, not from eye to eye as with all animals except Teddy-bears. This, however, compresses the stuffing of the face considerably and a false back to the head or a large mop of hair must be added.

HAIR

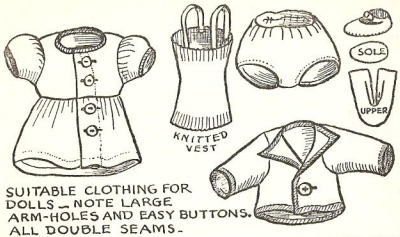
May be made of fur, wool or thread, the latter plaited or bobbed or, if looped, each piece must be firmly knotted with a button-hole stitch before cutting in gollywog style, so that the hair is not easily pulled out. For bobbed or long hair, cut to length required, stitch down the parting, catching each thread of hair. Back-stitch over the top, along the whole length of the parting, forming a wig. Back-stitch this to the head along the parting and catch other strands here and there to hold in place.

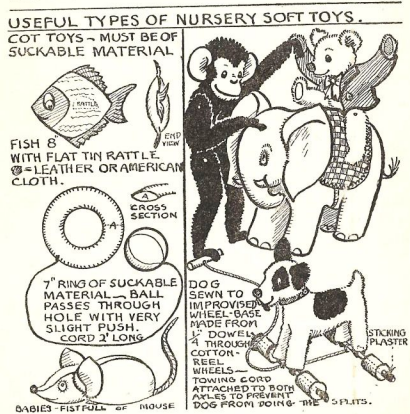
CLOTHES

Nursery toys' clothes should always be removable for washing. Make the sleeve holes really loose, about twice the width of the arm is correct. Easy buttons, bows and hooks are of real educational value, for by practising on their dolls the children learn also to fasten their own clothes, thereby becoming more self-reliant.

Remember that small hands wrench buttons and ties much more than grown-up and accustomed fingers, so dolls' clothes and limbs must be sewn on three times more firmly than you would normally deem necessary, using thread rather than cotton.

The sketches show clothes which have proved practical in use and easy for small folk to manipulate. Knitted clothes are also good to make.





A pattern for shoes is shewn, although a doll may well make do without them. They must have large enough buttons or hooks to fasten easily and firmly or they will be a source of annoyance by constantly falling off.

TIPS FOR CHEERFUL ANIMALS

MOUTHS, TONGUES AND NOSES.—Use a black button or padded button of red material for a nose; embroider a bright, smiling mouth with threads drawn tightly across through the face from the corners of the mouth to mould the face and enhance the smile; finish with a red felt tongue at a jaunty angle (curling it on a pencil will help this). A tight bow at the neck helps to emphasize the form of the face and gives an added opportunity for colour.

EARS.—Line ears with bright contrasting material or with pink or pale blue silk scraps. Fur ears for dogs, horses or rabbits are pleasant. Cut the linings $\frac{1}{4}$" narrower than the outside of the ear. Don't be too symmetrical, tilt one ear forward and the other back or lop-eared. Stiffen with thick material between lining and back when making long ears.

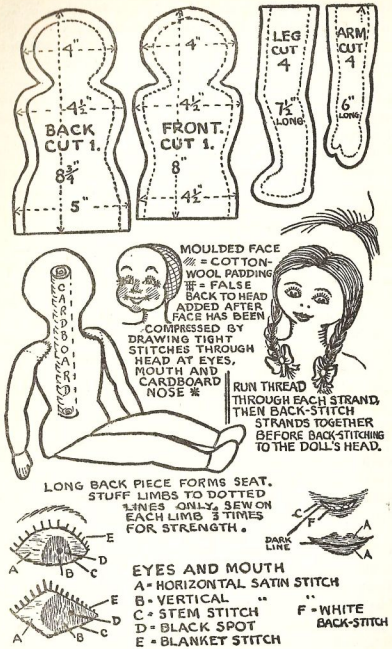
TAILS.—Rabbits should have white woolly tails and if dressed, must have a hole for their tails to come through. Saturday's dinner rabbit can supply a very realistic tail. There is no flesh on it.

Elephants' or donkeys' tails with an intriguing twist can be made by rolling up a wedge-shaped piece of cloth with fur or black tassel at the tip; when sewn, draw a thread tightly from the tip to the base, varying the tightness according to the exuberance of the tilt required.

DOLL.—The doll pattern shewn has proved to be a very good type and easy to make. General principles of soft toy making of course apply, with these additions:—

It is much more important for a doll to sit than to stand; this one sits without being propped, due to the shape of the back piece which folds over to form a seat.

Leave $\frac{1}{8}$" of both arms and legs free of stuffing so that they move with perfect freedom. A doll is less huggable if perpetually doing "arms stretch."



Note how the arms are sewn horizontally on to the shoulder, giving a more natural movement than if they were sewn on vertically down the side seams.

A pattern is also shown of a puppet doll. It is useful to have two or three of these in the nursery for story telling.

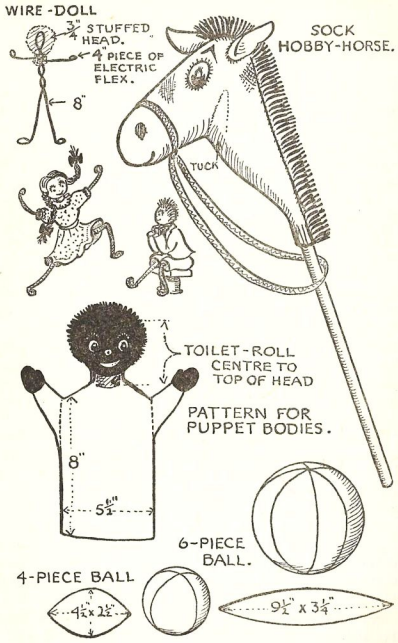
WIRE DOLLS about 4" high for dolls' houses or to ride about in toy trains can be made from scraps of old electric flex or "hair-curler" wire, either of which can be bent to any position without snapping. Limbs may be wrapped with wool or thread, but will be more durable if bound with strips of material, stitched at intervals to the wire. The head can be a padded button or ball of cloth, thumb-nail size, with features painted or embroidered, with wool or thread hair added.

HOBBY HORSE.—An excellent hobby-horse can be made from an old sock. Darns are of no account and may even add to its beauty. Take a tuck under the chin, stuff the sock and sew on ears and a furry mane; embroider nose, eyes and mouth, stitching firmly through the head at mouth corners and eyes. Fold in the top of the sock to fit a broom handle, which should be gaily coloured, add reins and your steed is ready to gallop away! There is no need for wheels on this type of hobby-horse, but round off the end of the handle well so that it will not scratch the floor.

BALLS.—A variety of sizes should be made. Large ones need 6 or 8 sections, small ones can be made with 4. Cloth stands up to harder wear than wool. If you put corks in the centre, your ball will bounce a little; the flat, paste-pot type of cork is best to use.

A good solid ball can be made by cutting an old stocking into a very narrow continuous strip, and winding it round a ball of newspaper. Knit or crochet a cover for this core with wool, thread or string. A papier-maché ball (see p. 108) with a knitted or cloth cover is light and bounces.

4-PIECE KNITTED BALL—Cast on 6 stitches, increase every stitch for four alternate rows. Knit thirty rows Knit 2 together for 4 alternate rows and cast off.



CHAPTER 8

LARGE TOYS

THE larger nursery toys have been dealt with in other publications so suggestions only are given here without any elaborate details.

WENDY-HOUSE

This may be made from a large-sized clothes-horse, or built up to the dimensions shown. The clothes-horse will probably need reinforcing and a window shelf added. Curtains for the window should be made to pull easily and the walls can be made from red Hessian or other firm material and must be removable for washing. Fix this to the inside of the frame legs by means of strong loops. Stain or paint the frame and it will give a " half-timbered " effect to your house.

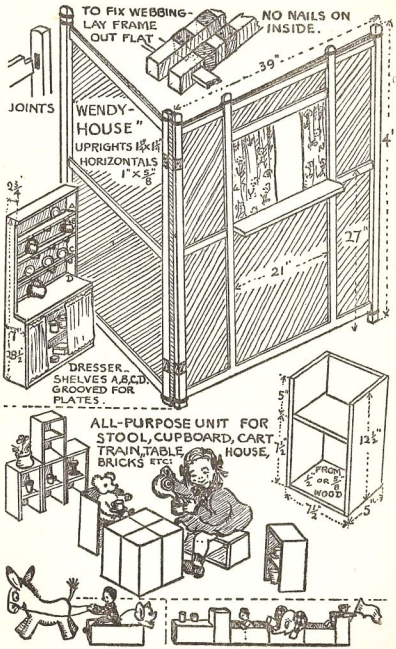
Note fixture of webbing hinges ; no nails on the inside edge, when the frame is laid out flat.

The Wendy-house fits into a corner of the nursery and should be fitted with miniature furniture the right size for a small child and her dolls, but altogether too small for grown-up use.

WENDY-HOUSE FURNITURE

The diagrams show an all-purpose fitting for the Wendy-House. Two or four make a table, one way up makes a doll's chair, the other way, a cupboard. On its side or end, it is a seat for a child, and several together will make primitive trains or motor cars. Sizes may be adapted to suit available wood, but be sure you work out an improved pattern before you alter the main sizes shown, which have proved to be usefully effective. The parts are nailed together and look well if stained one colour outside and round the edges, and a lighter colour inside.

Each nursery should include a selection of strong toys for indoor or outdoor use which will help to develop muscular skill and sense of balance. These should



include push and pull toys, rocking, swinging, climbing and jumping apparatus.

It is important to note when making toys on which children will ride astride, that the seat should not be more than a few inches across or you will be encouraging the development of bow-leggedness.

ELEPHANT ON WHEELS

A bear, dog, or horse would do equally well for this type of toy. A strong wooden frame is the foundation; round off sharp corners and edges so they will not wear through the material. Pad the frame well and screw to a firm wheeled base.

DOBBIN

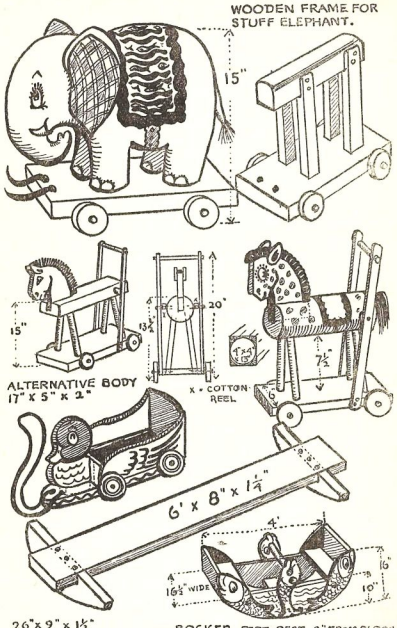
A 13" Dobbin should be made for one-year-olds learning to walk and one a few inches higher for the older children. Make the horse very strong and stable; the position of the handle is very important as the horse must not tilt when leant on by a child using it as an aid to learning to walk.

Fur or wool or paint would all be suitable for making the mane and leather or some washable material for the saddle and tail. Fix the tail by wrapping the leather round a piece of dowel, pinning it and then gluing the tail into a hole in the body.

DUCK CART

Small carts such as this are always acceptable in a nursery either for loading with goods or children. Even a 6" × 8" cart must be strong enough to carry a small child.

Any suitable bird or animal may be adapted to form a cart, but design for strength and be sure that ears are rounded in case a child should fall on them. The rope handle is better for nursery use than the long wooden handle so often used and which proves a constant source of tripping and a pest to pack away in a cupboard. The rope handle should be long enough for a child to get inside and play at being a "horse" for the cart.



ROCKER (A)

Every child likes to rock; this can be used by several children at once, and is low enough for them not to hurt themselves if they should rock too hard and fall off. The rockers are wider than the plank so that hands holding on do not get crushed.

ROCKER (B)

This is suitable for younger children who need a more secure type of rocker. Their feet are 2″ off the ground and there is a firm handle to grip on to.

WHEELBARROWS

(A) The " Utility " barrow should not take more than a few hours to make. If the box is not strong enough, strengthen the corners by gluing and nailing in triangular strips of wood. Screw box to shafts and straight legs from inside the barrow, counter-sinking the screws.

The wheel axle is fixed with gas-pipe clips (see page 23). The wheel MUST be of hard wood and at least 5″ in diameter.

(B) This is economical to make, the sides being cut from one hardwood board 3′ 7″ long × 6″ wide and ½″ thick.

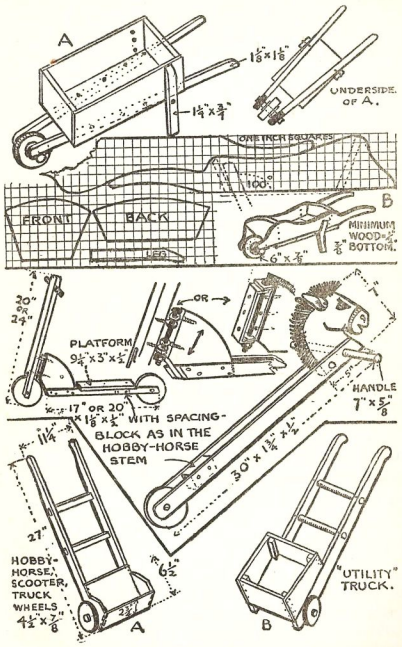
SCOOTER

Use hard wood throughout. Cut the bracket from a board at least 5″ wide × ⅞″ thick; being sure the grain runs as indicated. Use either very strong screw-eyes, or iron brackets ⅜″ wide by ½″ thick with a 4½″ wood bolt for the steering fixture. If brackets are used it is important to fix the handle bracket underneath, as it bears less strain.

(A) HOBBY HORSE

(A) Use 1″ or 1¼″ wood for the head; the suggested fitting gives good protection to both head and wheels. Leather ears are preferable to wooden ones on a run-about toy.

See also the sock hobby-horse on page 117.



PORTER'S TRUCK

Two types are shown, one with mortised and tenoned joints, the other with dowel rails glued and pinned into place. Strengthen box (B) with corner pieces. The axle is fitted to the wheel, the whole revolving on a $\frac{3}{8}$" gas-pipe fitting screwed to the underside of the truck. (See wheels, page 23).

CLIMBING HORSE

This was designed as a war-time substitute for the full-sized climbing-frame or jungle-gym. Proportions are important as they allow enough room for easy climbing by two-year-olds and also allow for a 6 foot plank, 10" wide, to be placed between any of the rungs.

The seat will hold four or even five children and should be padded well beneath its final covering which should be of an easily cleanable material such as rexine or leather.

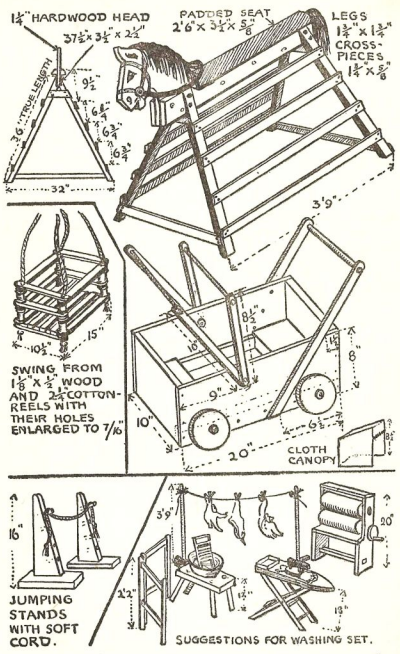
Thinner rails than the sizes suggested are not advisable and they should be made of hard wood. The head should also be made from 1" or $1\frac{1}{4}$" hard wood, or built up as suggested on page 9. If the horse is for indoor use, a stuffed head of coloured hessian can look very well but needs to be very firmly fixed. The leather or rug-wool tail is wrapped round a piece of dowel and glued into a hole and the mane sewn to a strong strip of cloth and nailed and glued to the wooden head.

With a rug thrown over him, the horse makes a good tent, so do not fix the bottom front and back rails too high for convenient stepping-over.

PRAM

This much beloved toy of the small girls can be made from a packing-case, 20" × 10" × 8" being a suitable size.

Wheels may be fixed in a variety of ways; one satisfactory way is to pass a $\frac{3}{8}$" axle right through the sides of the box, having first strengthened all round the bottom of each side with strips of wood, 2" × $\frac{3}{8}$". This makes a strong bearing for the axle, which should then be covered over to form seats; an added attraction.



All bedding should be made large enough to tuck in and any covers removable for washing.

The slope of the handle should be noted, the pram will tip if the handle slopes too far back.

The hood may be made of plywood or as shown, the frame bolted to the side. To make the hood pattern, turn the pram on its side and draw a silhouette of hood when full open; this will be your pattern for the hood's two side pieces. Tie the cover to the frame so that it may be removed for washing.

SWING

This is a safe swing for a small child. It is made of rails $1\frac{1}{8}'' \times \frac{1}{2}''$ and large cotton-reels, the holes of which are enlarged to $\frac{7}{16}''$ to take a $\frac{3}{8}''$ rope.

The middle front rail is missing for the child's feet to go through, two pieces of wood being inserted to make up the thickness of the missing rail. Use very strong rope.

JUMPING STANDS

Simple jumping stands about 16″ high are useful additions to nursery equipment. Adjustable pegs should be so arranged that the cord, which should be soft, falls immediately a child's leg touches it.

WASHING SET

This should be in miniature size so that a child can do exactly as Mother does, washing, mangling, hanging out doll's clothes and ironing them. The clothes post should be at least 3′ 9″ high, as the essence of clothes-line hanging is the stretching up you have to do.

* * * * *

Further suggestions for nursery toys could be made almost indefinitely—improvised percussion bands—rocking horses—small stools—easels—large engines—trolleys—there is practically no end, but a nursery should not be badly equipped if it had all the toys described in this book, so now OUT WITH YOUR TIMBER AND TOOLS AND FALL TO!

INDEX

(References to Illustrations are in heavy type)

INDEX